

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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A Single Lever Testing Machine.

The testing machine shown in the accompanying engravings was described at some length at the recent meeting of the Institution of Mechanical Engineers, England. The author of the paper, Mr. J. Hartley Wicksteed, in the course of his remarks stated that the lines upon which a testing machine may be constructed are as various as the different well-known types of weighing machines; yet there are one or two essential differences between the conditions under which a dead load may be accurately weighed, and those under which the strains upon a test sample can be ascertained. In the first place, a ponderable article counteracts the weights simply by its own gravity, leaving the weighing-beam free to oscillate until the balance is found; whereas a test sample, while having one end attached to the weighing-beam, must have the other end firmly held by an independent support. Hence care must be taken that no unrecorded strain passes through the sample, such as might be due to shocks which with a free load would expend themselves in oscillations. Also, since the weighing-beam in the case of a testing machine is not, as in a weighing machine, free to be adjusted into the horizontal line regardless of time, it is important that the balance be just in all positions of the beam throughout its range of deviation from the horizontal line. The limits of deviation should be small; and as the sample is subject to extension during the testing process, provision must be made for moving the position of the independent support.

For testing moderate strains, Mr. Wicksteed said that he preferred the steelyard in the form of a single lever to any other form of weighing apparatus, this being the type adopted in the 50-ton testing machine shown in our engravings. As seen in Fig. 1, the machine is provided with a sample for tensile strength in the holders. Fig. 2 shows the machine arranged with the deflecting or transverse strength testing apparatus, and the sliding weight is in the position of equilibrium with the index at zero. The sliding weight is in this case in a position where it balances a pull of 25 tons. The reader will at once be struck with the fact that the slide can be made to pass beyond the fulcrum to the short end of the lever, till a point is reached where the long end is balanced. Among other novel features are the arrangement of a non-pendulous traveling weight, of which the center of gravity moves along a center line drawn through the point of support and the point of attachment of the sample; and the indifferent equilibrium of the whole, which is attained by: arranging the weight of the lever and all its attachments symmetrically above and below this center line. The clips that hold the sample for tensile testing are parallel, serrated on their inner faces, and at the back are tapered to an incline of 1 in 6. At this angle the clips are found to give the necessary bite, but loosen the hold when the strain is removed. At the back of the clips are half-round pieces, made free to revolve in the cast-steel clip-box; by this arrangement the clips are enabled to swivel, and so can adjust themselves to bite fairly across a sample even should it not be of truly rectangular section. The sample is similarly held by clips at its lower extremity; and the lower clip box is attached to a bonnet, which screws on to the rod of a hydraulic piston.

A section of the cylinder in which this piston works is shown in Fig. 3. The long horizontal cylinder, shown at the back of the machine, with central piston-rod and pair of parallel horizontal screws connected to it by a crosshead, has the same arrangements in section as the pulling cylinder, but it is one-fifth the area and five times the length of stroke. The annular space at the right-hand end of the horizontal cylinder communicates by a hydraulic pipe with the annular space at the top of the pulling cylinder, and at the piston area at the left-hand end of the horizontal cylinder communicates with the piston area at the bottom of the pulling cylinder. By this arrangement the mechanical parts, as screws and gearings, are called upon to act only under a pressure of 10 tons, and no further friction, except water friction, comes into play in transmitting this into a 50-ton pressure upon the slower moving pulling piston. The latter has a vertical motion of 6 inches in its cylinder to allow for extension in the sample. Besides this, the bonnet attached to the shackle can be screwed upon the piston-rod over a range of 6 inches to accommodate different lengths of samples. Water is forced into the cylinder either above or below the piston, by means of a smaller piston in a horizontal cylinder. This small piston is forced along its cylinder by means of twin screws, acting through a crosshead upon the piston-rod, and driven through gearing actuated either by hand or by power, thus insuring a perfectly steady motion. The annular area in front of the small piston, bears the same ratio to the annular area on the top of the large one as exists between the whole areas of the two pistons. There is, therefore, solid water from piston to piston on both sides, and the large piston responds at one-fifth the speed to every motion made by the small one. It will be understood that the hydraulic piston, through its attachments, puts the required pull upon the test sample, and takes up the necessary extension; the other end of the sample is carried, by attachments, from the steelyard, and, as the pull at each end of the sample is

necessarily equal and opposite, it follows that the weighing apparatus balances, and indicates the precise force with which the hydraulic apparatus is pulling. The lever for thus weighing the pull has a 1-ton weight upon it, which lies over the lever like a saddle, and will travel from end to end of it. When the weight is at the short end of the lever it balances the long end, and the adjustable index finger, carried on the weight, is made to coincide with zero on the fixed scale when the weight has reached a position which puts the lever and all its attachments into equipoise. The knife-edged centers being 3 inches apart, it follows that, after zero has been established at the balancing point, every 3 inches that the 1-ton weight is moved along the lever, as indicated on

gravity coincides with the center line of the lever, it follows that, however fast it is propelled, or however suddenly its motion is arrested, the momentum can have no effect whatever upon the oscillations of the lever. Motion is imparted to the traveling weight by a screw passing along the lever between the side plates. The screw is driven by a small countershaft, bracketed out from the side of the lever, and the countershaft in its turn is driven by a belt from a pulley running in supports on the main body; but as the center line through both spans of this belt lies in a vertical plane passing through the fulcrum of the lever, the pull upon the belt in no way affects the equilibrium of the lever. The belt is driven either by a hand wheel or from a lay shaft, as most convenient. The

equal to that of a cannon ball, in order to raise the earth one inch in 2,700,000,000,000 years.

The Engineering Trades of Great Britain.

The half-yearly engineering trades report of Messrs. Ma'heson & Grant, of London, furnishes in interesting material for reflection. Briefly reviewing their remarks, it would appear that the activity in iron and steel shipbuilding for the last two years is still maintained, English, Scotch and Irish yards being all fully occupied. Prices also steadily advanced during the two years ending last January, conclusively shown by the fact that

of steel for this purpose at some future period. The success of French shipbuilding yards, which are now being established at different points, and some of which are already in operation, is thought to be extremely doubtful considering the low cost of construction made possible by the experienced organization of British shipbuilders, better workmen and various other advantages.

Bridge builders are generally well employed, and though British contracts still command only low prices, the export trade shows some improvement. During the last half-year there have been considerable contracts let for railway bridges in India, although now that the strategic lines of the Indian State Railways are so far advanced, Government orders are not so frequent as during the last few years. The Benares Bridge, in which more than 7000 tons of steel are used, is proceeding rapidly, the sinking of the caissons being now in progress at the site, and the superstructure well advanced at the works in England. Considerable orders have been given out for bridges for the self-managed Indian railways, and for railway and road bridges in the Australian and South African colonies. The placing of these orders with English bridge builders, through the agents-general of the various colonies in England, is gradually giving place to a system called for by colonial public opinion, by which works of this kind are submitted to a competition of local contractors, who entrust the ordering of the ironwork to their own correspondents in England. How far this method will conduce to economy and good quality remains to be proved, but, at any rate, it stimulates the enterprise of colonial engineers, contractors and merchants.

Activity is still the prominent feature among locomotive builders, and the large number of orders for all sorts and sizes of engines for Indian, colonial, and foreign railways, as well as for British lines, render it extremely difficult to make contracts for delivery earlier than next spring. Continental makers also show the prosperity of this branch of trade. Railway carriage and wagon builders, though freed from the distressing competition which prevailed for some time past, are not yet fully occupied, and can command only moderate prices. New railways of considerable importance are projected, furnishing every indication of future activity.

The principal districts offer a wide field for mechanical engineers, and the machinery export returns for the last six months are unprecedentedly large, the various colonies taking large quantities of machinery. Tool makers also are enjoying an improved trade, not only by supplying standard tools, but in the manufacture of special machines for operations hitherto possible only by hand labor. New orders, however, are not coming forward so briskly as makers would desire, and there is a tendency toward rather lower prices for future delivery.

The Continental demand for agricultural machinery is said to be on the whole good, for though unfavorable reports are received from Spain and the South of Russia, the harvest prospects of Germany, and the corn districts of Austro-Hungary are all bright. The export trade is very brisk also in portable engines, and so fully are the principal makers occupied that new orders cannot easily be placed for prompt delivery. The use of traction engines and road rollers is extending, minor improvements are made which render them more useful, and as they will work effectively on gradients as steep as 1 in 7, they may be adopted in many cases where horse traction is almost impossible. The compound system of high and low-pressure cylinders has been applied successfully to portable engines, and appears to render them more equable in their speed, which though not always of importance, is an advantage in such cases as the working of dynamo-electric machines for the electric light. Brickmaking apparatus of all kinds is receiving wider attention than formerly, and the machines are better made and in greater variety.

The numerous public works which are projected and commenced appear quite sufficient to maintain the present rate of employment, and the immediate future in all departments is encouraging.

Railway Building in the South.—Considerable activity has been displayed in railroad construction in our Southern States since the business revival of 1879. The new mileage has not only been greatly increased, but the old roads have been improved to a considerable extent. At the close of the current decade the Southern section will have a network of railways of an extent about three times as great as that of 1870. The development has been most marked in Texas, Arkansas, Louisiana, Georgia and Florida, although gratifying progress has been made in all the other States South of the Ohio and Potomac. According to official returns during the year ended June 30, 1882, 1500 miles of new railway were put in operation, showing an increase of about 1000 miles over the previous year. The gross earnings have also experienced a remarkable increase within the past few years, shown by the fact that in 1879 they amounted to \$43,000,000; in 1880, to \$45,000,000; and in 1881, to \$63,000,000. The net earnings increased from \$14,000,000 in 1879, to \$18,000,000 in 1880, and more than \$24,000,000 in 1881.

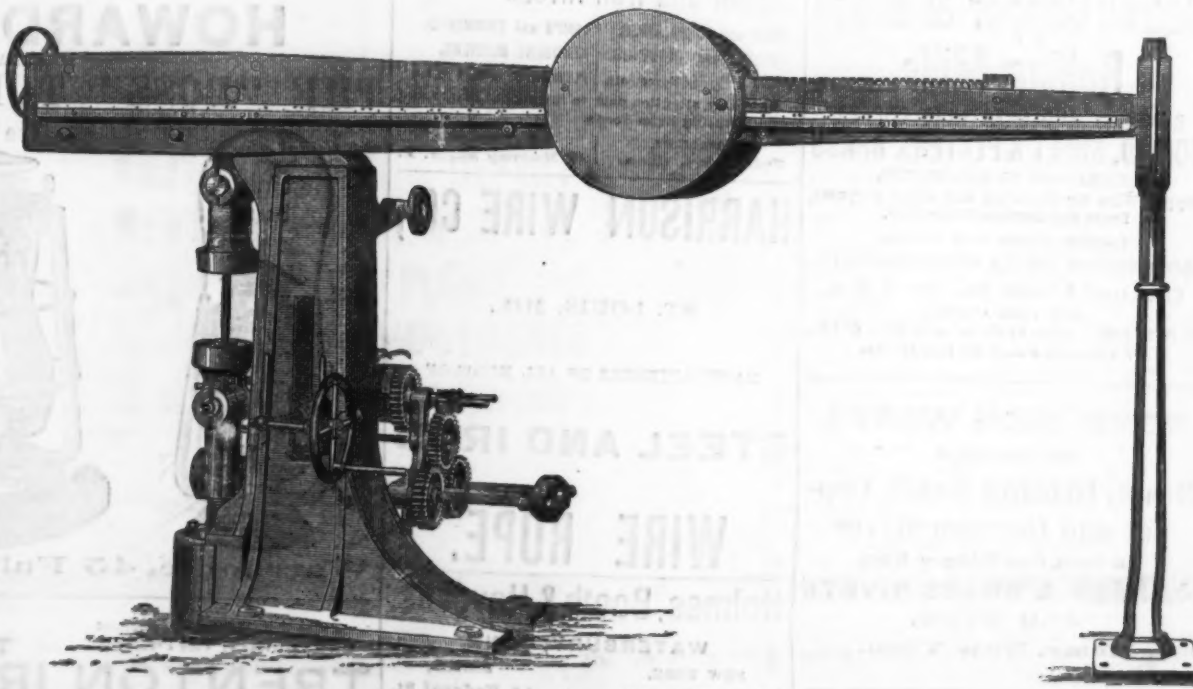


Fig. 1.—Testing Machine Provided with Sample for Tensile Strength.

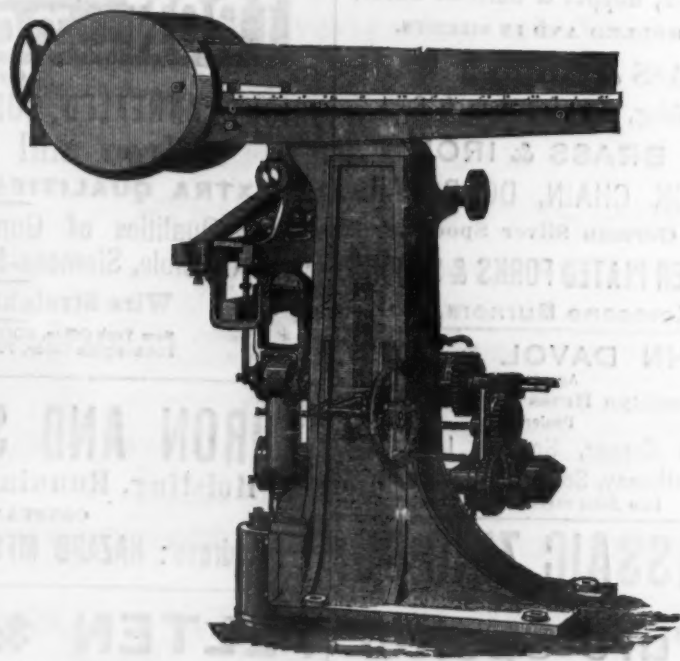


Fig. 2.—Testing Machine Arranged with Transverse Testing Gear.

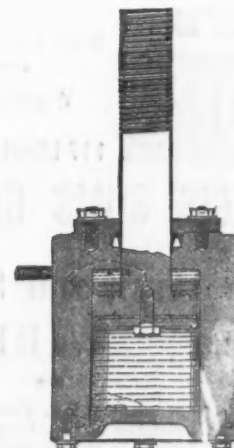


Fig. 3.—Section of Screw Pump.

SINGLE LEVER TESTING MACHINE, BUILT BY MESSRS. J. BUCKTON & CO., LEEDS, ENGLAND.

the scale, throws one ton of unbalanced load upon the test sample.

The weight travels 150 inches, or 50 times the distance between the centers, so that at the end of its travels it will balance a pull of 50 tons. Every 3 inches on the fixed scale is divided into tenths and hundredths, so that with the index finger on the traveling weight the load can be read off in tons to two decimal places. There is, moreover, upon the index finger a small vernier scale, which again subdivides the hundredths on the fixed scale into 10, and by means of this vernier the third decimal place of tons, equal to 2½ pounds, can be read with the greatest facility. Thus, without the use of any small auxiliary weights, the most accurate results can be ascertained by the mere position of the heavy traveling weight upon the lever, and errors are reduced to a minimum, for there need be no more margin of error in a 1-ton weight than in a 56-pound weight; and here, with the extreme leverage of 50 to 1, that error can be multiplied only by 50, instead of by any higher multiplier. As the moving weight is not hanging freely, but is carried by four wheels, it is kept rigidly in line with the lever, and as its center of

outer end of the lever oscillates in an opening through a vertical standard, in which it has a range of about 1° above and 1° below the horizontal line. In the bottom of the opening there is a thick block of wood, upon which the end of the lever falls, without undue jar, when the sample breaks. Throughout the whole of a test it is easy to keep the lever floating; for, owing to the low multiple of its power, its movement is slow. The aim is to avoid all vertical movement of the steelyard, and thus to prevent any unrecorded augmentation of pull upon the sample, such as would be due to the momentum of a moving steelyard.

History has handed down to us the saying of Archimedes: "Give me whereon I may stand and I will move the universe." Ferguson, a celebrated astronomer and naturalist, calculated that if Archimedes had been furnished with a support at a distance of 9,000 miles from the center of the earth, with materials of sufficient strength and a counterpoise of 300 pounds, a lever having a length of 12,000,000,000,000 miles would have been required, and the velocity of the extremity of the long arm would have been

while at the beginning of 1880 the price of passenger steamers ranged from about \$105 to \$125 per ton, and of cargo steamers from \$80 to \$95 per ton, prices from \$15 to \$20 above these rates have been paid on recent contracts, and even at these advanced prices it has been difficult to obtain early completion. Though there has not been a corresponding advance in the price of materials, the advance apparently gained in this way has been largely, if indeed not fully, neutralized by the increased rates of wages paid to the workmen, and, as usually occurs with high wages, work has been delayed very much by the loss of time in holidays and dissipation. Owing to indications that the increased cost of steamers is causing a lull in the demand, makers are inclined to make contracts for future delivery on easier terms. Steel is gradually crowding iron out of the market for shipbuilding purposes, and where the latter material is still used it is due to the difficulty of obtaining prompt supplies of steel plates. The advantages of steel as compared with iron are still more apparent in boilers, and with the increase of the working pressure which is being adopted, there seems to be little reason to doubt the exclusive use

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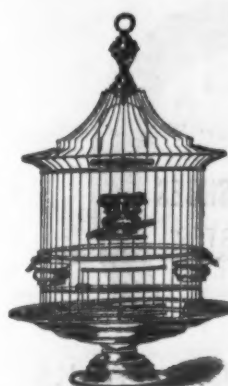
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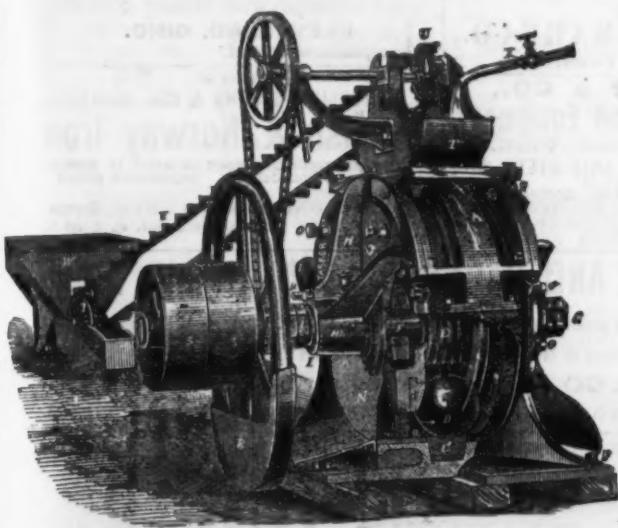


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Early Recollections of the New York Fire Department.

We are in receipt of the following from Mr. H. Sweet, of Middletown, Conn.:

I read with considerable interest an article describing the river fire service, published in a recent issue of *The Iron Age*. I was particularly struck with the account of the valuable services rendered by the fire-boat William Havermeier and crew. I was the more interested in the story because it carried me back in memory to my early recollections of the fire department as I saw it away back in the early part of this century, before it had come of age. I was then a youngster and lived in the city, and like many boys ran with the machine, carried water, and often refreshments that were furnished gratis by the hospitable people during long or large fires. I have in mind that more than once wealthy families have opened their houses and fed the firemen. The department at this time consisted of about 30 companies. These companies were of the best material in the city—merchants, traders, mechanics and others who took an interest in the fire department, its discipline and usefulness.

At that time it was not a labor of love to the firemen, but duty—hard duty. Such was the character and reputation of the fire department for honesty and trustworthiness that a fireman's cap was a much better passport in time of fires than a policeman's badge is now. The supply of water at this time made the labor of the fire department severe. They had no Croton as now; all the water for the extinguishment of fires had to be pumped from the several corporation pumps located in various parts of the city, and at convenient distances for the use of the citizens as well as fires. It required from two to four men constantly at the pump-handle or brake, and these had to be relieved frequently. Many of the wells and pumps would soon get exhausted of water, or as often get out of order, and then for a change to some new location. I have often seen four, five and six machines in line to get one stream of water on the fire, the pump or cistern nearest the fire having given out.

Another feature of the fire department at my earliest remembrance, was its fire buckets. Every household was obliged to have 12 fire buckets, made of leather, with the owner's name and number. These were kept hung up or suspended over the door as you entered the hall. These buckets were often put to use in various ways; to bring water from back-yard cisterns where engines could not be placed. I have seen long lines formed by the citizens for the purpose of furnishing a supply of water. Buckets would be passed from one to the next, and so in the return of buckets. The introduction of the Croton changed all the old methods, as well as the labor of the department and its character.

Many years ago the Manhattan Water Works was chartered in connection with the Manhattan Bank. Its promise was to give the city pure water, and plenty of it for all purposes; they did neither. The reservoir was on Chambers street where Center street crosses it. The reservoir was not large; a small affair. The well for supplying the reservoir with water was in Orange street, and forced up in the reservoir by steam when I first saw it. The water was distributed to the lower part of the city east of Broadway, and particularly to the Manhattan Bank, in chestnut logs, with a bore or opening from 2 to 4 inches, according to the location. The supply failed in quality as well as quantity, as promised. For good water the residents of the lower portion of the city were obliged to patronize Knapp, who kept several carts moving in summer with his celebrated spring water, which was taken from a spring near Greenwich village, and sold for two cents per gallon.

The fire department in those days was held in high repute by the authorities and citizens, in its organization having discipline, good order and usefulness—so much so that when General Lafayette was in this country to pay us a visit in 1824, the whole fire department turned out for a review and bid him welcome. At this time the department numbered, all told, truck or hook-and-ladder company included, some 41 or 42. The parade was in September of that year, and the review and reception was in the Park. The right or No. 1, was near the Hall of Records, the left or No. 2 company, nearly opposite, on the Broadway side.

They turned out with three machines and five rigs, as soldiers do for dress parade. Lafayette, with the Mayor, city authorities and Chief, with a few invited guests, visited every company in turn, was introduced to the foremen and assistants and to the men in general as we introduced a speaker. The General complimented the companies for their fine, manly appearance, good order and discipline; also for the neatness, cleanliness and good order of the machines and fine apparatus. This was a proud day for the fire department, as many can testify who saw it. New York at this early date was not without its river fire service. They had a large boat with a large fire-engine of the rotary motion in it; it was worked by labor or hand-power, for steam had not, at that early day, come into use. This boat was moved from place to place as wanted, with oars. She was stationed on the East side of town, for at this time there was but little business done on the North river side; even all the North river sloops and trading craft came in east of the battery. This fire-boat (Enterprise, I believe was her name) was supplied with plenty of hose and fire equipments, and often did good service when a fire was near the river, and when distant from the river in supplying water to connecting lines of engines. I will recall a large fire in Vesey street: Every thing was dry, water scarce, and some distance from the river the fire spread rapidly and all looked blue, fortunately the Enterprise arrived and tied up at the foot of Vesey street; soon three or four additional streams were furnished, new lines formed, and the fire got under control.

I was somewhat surprised when I read your article or story of the river fire service, to find that a city of over 30 miles of water front and its surroundings, shipping and wealth, had not increased this sort of fire service in the last half century. It is

true the present river service is much more efficient than the old; this is moved and worked by steam; that by labor or hand power. Has this service kept pace with the growth of the city, its wealth, surroundings and shipping? You will answer no. New York must be liberal, generous and just with her customs, both foreign and domestic. She cannot do better, nor offer greater inducements to trade and commerce than protection to life and property.

It seems to me that only this morning New York was a city not larger than Buffalo is now, and her surroundings, Brooklyn, Newark, Jersey City and Hoboken mere country villages. Now, at evening, they are all large cities. New York then had but little commerce; her trade with the country was small, confined mostly to the river and adjacent counties; three or four steamboats (the old North River Co.) did all the business between Nyack, Albany and the intervening towns. Then came the completion of the Erie and other canals; this gave new life to New York, her commerce increased and so did her trade with the interior. Our people do not favor the project of free canals so strongly urged by New York and Eastern localities. To hand over the canals to Western producers and speculators, and pay them for taking them, or keeping them in repair by taxation on the property of the State, will be a great drawback to the prosperity of the agricultural districts not located in fine, favorable places. Before New York asks the country to make this sacrifice for her interests, let her amend her pilot charges, her port and dock charges, and get rid of the barnacles which fasten on the domestic and foreign commerce and trade.

Taxing Commercial Travelers.

Recent cases, says the *New York Times*, suggest examination into the subject of commercial travelers and the attempts made to restrict their work by State and municipal taxation. The drummer has long been a favorite butt for the newspaper humorist, and his peculiarities, thus exaggerated, are far better known than his commercial importance. A list has been given of 10 associations of travelers, in as many cities, having at the time a membership of 11,477. The two largest ones were in this State with 2625 members, organized in Syracuse in 1872, and the Northwestern Association, of 2500 members, organized in Chicago in 1875. Special organs in this city, Syracuse and Chicago urge such purposes as insurance, concessions from carriers and hotels, exchange of information, social intercourse and so on; and yet the associations represented were believed to include not more than 12 per cent. of the commercial travelers of America. The comparative advantage of this expensive instrumentality of communication between manufacturers and wholesalers, or wholesalers and retailers, is always in order for contention, but the fact is that the traveler is almost entirely a trade development of the last quarter century, and he is expanding. This seems conclusive as to his usefulness, for those for whom he "drums" would not keep him if they could sell better, and those at whom he does this would not listen to him if they could buy better in any other way. Quicker transportation and communication does not suppress him, and he must be supposed to be worth while.

But in some States the hostility of the traders, who naturally dislike to have competition come from a thousand miles away to their very doors, has demanded interference, seconded by that ever-present disposition to put taxes on what seems to be distant and foreign. Hence, States and even municipalities have imposed license laws. Twenty States and six Territories make no attempt to deprive commercial travelers of freedom, nine levy no tax, but authorize municipalities; in two States there are both kinds of tax; eight States and two Territories lay a tax by the State authority, and in about half the provinces north of us the tax system prevails. We should add, however, that this summary is from data about a year old, and no attempt has been made to correct it to date, inasmuch as the intent is only to show about the extent of this taxing system, rather than to give an exact schedule of it from State to State.

Judge Hughes, of the United States District Court, sitting in Richmond, last month rendered a decision in the *habeas corpus* case of Thornton, a traveler for Baltimore parties, who was imprisoned in Norfolk for selling by sample without having paid the State tax. The governing law on this subject was laid down in the leading case of *Ward vs. Maryland* (12 Wallace, 418), decided at the December (1870) term of the United States Supreme Court. The complainant, a Jerseyman, had sold harness in Baltimore by sample, and was indicted and fined \$200. The case was taken up by the association of travelers, who employed Mr. Evans to carry it up from the highest court of the State. The law applied to all traders, resident or non-resident, but not alike, the latter being required to pay \$300 for a license to sell, while the former were to pay according to a sliding scale, which was based on business done, but not above \$150 maximum. Judge Clifford rendered a decision against the State, of course, upon the ground of discrimination exercised against non-residents. "Grant," said he, "that the State may impose discriminating taxes against citizens of other States, and it will soon be found that the power conferred upon Congress to regulate inter-State commerce is of no value, as the unrestricted power of the State tax will prove to be more effective to produce inequalities than any regulations which Congress can pass to preserve the equality of rights contemplated by the Constitution among the citizens of the several States." Justice Bradley, concurring, was unwilling to stop there, but went further, pronouncing the law in violation of the commercial clause of the constitution which gives Congress the control over inter-State commerce, and he declared that it is indifferent whether there is any discrimination in the tax. "Such a law," said he, "would effectually prevent the manufacturers of the manufacturing States from selling their goods in other States un-

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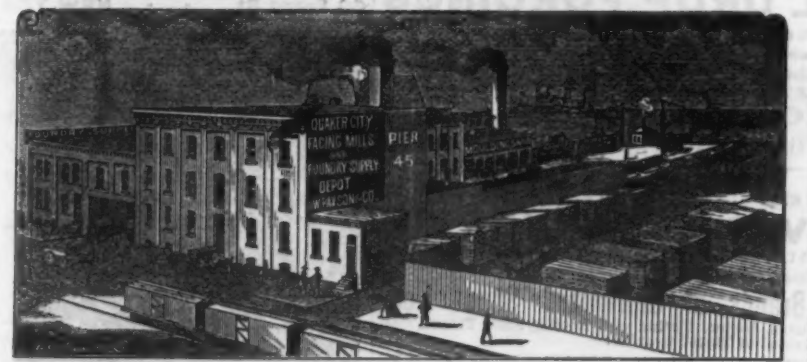
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less they established commercial houses
therein or sold to resident merchants who
chose to send them orders. It is, in fact, a
duty upon importations from one State to
another under the name of a tax. I there-
fore dissent from any expression in the
opinion of this court which in any way im-
plies that such a burden, whether in the
shape of a tax or a penalty, if made equally
upon residents and non-residents, would be
constitutional." The prior case of Paul vs.
Virginia (December term, 1868) was also re-
ferred to.

The Hughes case has now been decided in
favor of the State of Virginia on the sole
and express ground (as far as appears from
the statement of it by telegraph) that there
is no discrimination in the law. But the
question arises, not whether a State may tax
residents and non-residents equally, but
whether a State may tax outsiders at all.
There can be no doubt that, as respects com-
mercial intercourse, State lines are obliterated
by the Federal compact, which intended
to make it impossible that the States could
become little principalities, each with power
to put embargoes on trade. A State cannot
levy import duties. A contrary doctrine
gives each State power to exclude goods by
statute; for, if the tax itself be admitted,
the amount of it cannot be defined.

Hence, the subject is not yet quite *res
adjudicata*. In Ward vs. Maryland, the
Supreme Court said that no State shall tax
non-resident salesmen discriminately, and
Justice Bradley in effect said he will not con-
sent that a State shall tax them at all. The
final decision is thus foreshadowed, and, one
way or the other, cannot be reached too
soon.

Speed of Steamboats.
It is a standing belief among shipbuilders,
yacht owners and steamboat men generally,
that there are a number of vessels afloat ca-
pable of making 25 miles an hour. It is also
reported that there are many vessels, es-
pecially English torpedo boats, that have
made 23 and 24 miles an hour. We have re-
peatedly seen reports of trial trips in which
the average speeds attained were from 23 to
25, and in one case even more miles per
hour. It may be well in this connection to
call attention to a fact for which many naval
authorities are unable to account, and that is,
that Government vessels which had never
made over 12 miles in 60 minutes and in their
best days could not exceed this, chased and
captured blockade runners which had made
17, 18 and even 20 miles per hour on their trial
trips. We have also resorted to the fact that
a friend of ours who has a steam launch that
can only make 12 miles in an hour when hard
pushed, almost invariably overhauls boats
which their owners think are capable of
making 15 and 16 miles per hour.

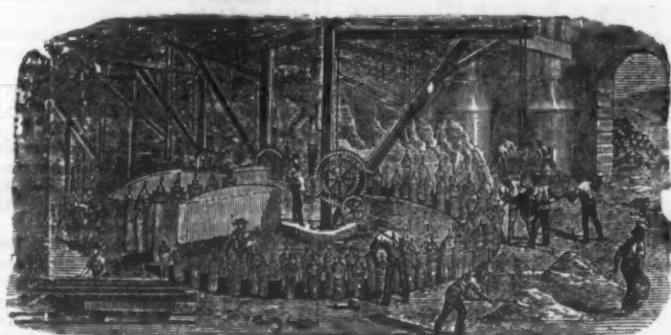
It is quite a different thing to say how fast
a boat can run over a measured mile and to
measure the distance she makes in an hour.
We know of a little boat on the Detroit River
that can regularly make a measured mile in
3 minutes, varying 1 or 2 seconds one way or
the other from that. With the utmost crowd-
ing the same boat has never been able to
make more than 15 or 16 miles in 60 minutes.
It is one thing to be able to make 20 or 25
miles an hour on a river with the wind and
tide favorable, and another thing to make 25
miles "through the water." We are not yet
ready to believe that any boat has reached
the latter speed "through the water," al-
though the record may have been made "over
the bottom." The remarkable records made
by boats in olden days on the Hudson River
have had no small amount of discredit
thrown upon them of late years since the
Government surveys have been made. The
truth seems to be that in the old estimates
more miles were put into the river between
this city and Albany than there was comfort-
able space for. The consequence was they
were somewhat short at the ends. We be-
lieve the river channel from the foot of Canal
or Vestry street to Rhinebeck measures only
90 miles, and unless the vessel's course can
be plotted on a chart, we do not think she
can get credit for more than that distance in
making a run between those two points.

The steamer Albany some time since ran
to Poughkeepsie in 3 hours and 13 minutes
from Twenty-fourth street, which we believe
is the fastest time ever made by any boat or
any steamer except, perhaps, the Idaho in
her famous trip to Japan. The run to Pier-
mont was made at considerably less than the
best rate of speed, and occupied 1 hour and 2
minutes. From Cozzens' Landing to West
Point, which is called 1 mile, her time was
2 1/2 minutes. This is exactly at the rate of
24 miles per hour. The steam pressure on
the occasion of this very remarkable trip was
47 pounds. The engine was making 26 1/2
revolutions per minute. The distance mea-
sured on one of the Government maps in the
center of the channel from the New York
starting place to Poughkeepsie is 74 1/2 miles.
This run was made without a stop. This
gives a speed of 23.165 miles per hour, sup-
posing that the vessel sailed only the exact
distance measured along the center of the
channel. Calling the distance 75 miles, the
time would be as nearly 24 miles an hour as
possible. We announce this belief with a full
knowledge of the statements recently made
by an English paper in regard to the fast
time of some of the Holyhead and Dublin
steamers. In one of these we find the state-
ment that the run from Dublin to Holyhead
is "about 65 miles," and that the Violet had
made the run in "a little over 3 hours,"
making "a speed of very nearly 21 knots."
Beautiful confusion! If the speed stated was
attained the vessel would have made 72 miles
in 3 hours. The probabilities are that 21
statute miles was all that was made, and the
"little over" accounts for the rest.

A serious accident recently occurred at
the Eston Steel Works, Great Britain. One
of the converters was being moved to a hori-
zontal position when the bottom suddenly
gave way, throwing some 15 tons of molten
metal in the vicinity of a large number of
men. Four of them failed to escape in time
and were all more or less burned about the
body. An examination of the converter re-
vealed the fact that four large bolts fasten-
ing the blast box to the bottom of the vessel
had given way, the bolt heads being burned
off by the molten metal which must have
found its way through the lining of the con-
verter.

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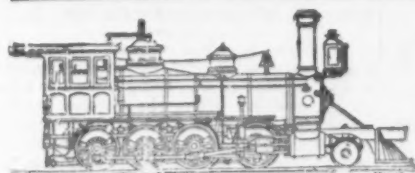
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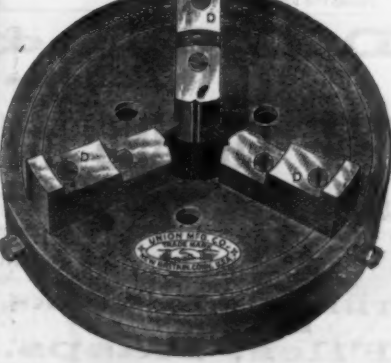
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Electric Lighting.

Although the illuminating property of electricity was known more than two centuries ago, it is only within the past few years that any considerable public interest has been attached to it, and that the electric light, for practical use, has become an established factor in domestic and commercial economy. It will, therefore, not be uninteresting to give a brief account of the present condition and future prospects of the most widely-known electric light companies in this country. Among them we would mention, first, the American Electric Company, the manufactory and office of which are at New Britain, Conn. Dynamo machines, regulators and electric lamps for arc lights only are turned out, the generator used being that patented by Elihu Thompson, and the joint improvement of Elihu Thompson and Edwin J. Houston. This company furnished the lighting of the large central portion of the Exhibition building of the New England Manufacturers' and Mechanics' Institute at Boston, in 1881, and has now 80 lamps in that building. Forty lights are in operation at Lynn, Mass., and contracts have been signed for 60 more. A sub-company in Kansas City, Mo., has over 100 lights in operation. Machines and apparatus for the permanent lighting of factories, mills and stores in New Britain, Meriden, New Haven, Bridgeport, Waterbury and other cities, have been supplied by this company, while the Philadelphia agency appears to have been successful in placing the lights in that city and neighborhood. The power consumed by this system of lighting averages two-thirds of one horse-power for lamps of 2000 candle-power, and a single generator will operate 30 arc lights. The whole apparatus is extremely simple in construction, and is claimed to require less attention than many others, due to the use of an automatic regulator, which adapts the power to the number of lights to be maintained. There is no noise while the generator is in operation, a feature, objectionable for various reasons, thus being avoided, and the regulator above mentioned, besides adding to the convenience and economy of the light, contributes in some respects to its safe use in buildings.

The Brush electric light has met with a favorable reception generally, and about 18,000 of these lights are now in operation in this country, 1000 being placed at different points in this city, and the company consider that it has passed the experimental stage of operations, and now stands on the same level with the various gas light companies. The regular size of the Brush machine in greatest demand is one producing 40 lights of 2000 candle-power each, the various other sizes yielding from 1 to 20 lights, and 1 horse-power is required for each light of this size. The apparatus employed is manufactured by the Brush Electric Light Company, of Cleveland, Ohio, and these works are claimed to be the most extensive of the kind in the world. They consist of two large machine shops, one 265 by 122 feet, one story high. The carbon factory is 450 by 62 feet. There are numerous other buildings, covering several acres of ground, and affording accommodations for from 700 to 800 workmen. The carbon department runs all night and turns out about 9,000,000 carbons per year.

The Edison Electric Light Company owns the patents of Thomas A. Edison, and was organized in October, 1878, with a capital stock of \$300,000, which has been twice increased, and is now \$720,000. Active preparations have been made for some time past with the view of putting the light in practical operation in the lower part of the city, and the company expect to illuminate the district considered in a short time. The number of lamps contracted for comprises 7916 A (16-candle) lamps, and 6395 B (8-candle) lamps, or 14,311 in all. These lamps are now in store ready for use. The central station will supply the electric current not only for these and additional lamps, but also to run motors for elevators, hoists, printing presses and machinery of all kinds. The Edison underground conductors are semi-cylindrical rods of copper placed in iron pipes. The tubes are filled with an insulating composition, and laid about 28 inches below the surface of the ground, just outside the curb. At distances of 20 feet the main conductors are joined together in an iron box, and tapped for house service, the service pipes containing smaller wires, running from the box into the cellar of the house and connected with the wires in the house.

Closely connected with the system of conductors is the "safety catch," which corresponds to a safety valve on a steam boiler, or an overflow pipe in a water system. Mr. Edison claims that, by means of this device, he obtains complete control over the electric current, and that fire is impossible. The "safety catch" consists simply of a small piece of wire made from a metal fusible at a comparatively low temperature, which is inserted in every circuit. It is contained in a small adjustable plug, and should the current, for any reason, exceed its normal capacity, this little wire would immediately fuse and interrupt the circuit, but may be restored at once by the insertion of a new plug, the work of a moment.

The Edison lamp consists of a pear-shaped glass globe about 4 1/2 inches in height, exhausted of air, into which is sealed a filament of carbonized bamboo a little thicker than a horsehair. Two platinum wires connect this filament with a metallic screw and tip on the plug below, which in turn makes electrical connection with corresponding parts of a socket into which the lamp is screwed. This socket may be fitted to any form of gas fixtures. The wires conveying the current are fastened to it, so that, when the lamp is in position, the platinum conductors and the carbon filament constitute a part of the electrical circuit, the current being conveyed into the lamp by one wire and out by the other. The electric meter designed by Mr. Edison has already been described in our columns, and does not, therefore, require further comment in this connection.

The Fuller system of electric lighting, which is now used in several large establishments in this city, was proposed by Mr. J. B. Fuller, of Brooklyn, N. Y., who was one of the first in this country to undertake the perfection of dynamo-electric generators.

The company, which was organized in October, 1878, confines its operations to the arc light, and manufactures electric generators of various dimensions, from one light to thirty, all on one plan. These machines are so constructed as to supply the greatest attainable electric force in proportion to the material employed. This company's lamps are of three kinds—single, duplex and focusing. The single lamp consists of a hollow suspended tube, a cylinder containing the apparatus for regulating the movement of the positive carbon pencils, the frame, between the side bars of which the carbon points are placed, and the bottom plate which contains the negative carbon holders. The carbons burn from seven to eight hours. The duplex is a modification of the single lamp, having two sets of carbons, changing the electric current automatically from one to the other when required. These lamps are convenient when a light is required all night, and can be used singly or with any number on a circuit. When one set of carbons is consumed, another set is automatically lighted, without any cessation or diminution of light, and using 7-16 inch carbons, will burn from 14 to 16 hours. The power required for running these lights is said to be three-quarters of a horse-power for a light of 2000 candle-power, for generators of 10-light capacity and upward, and 1 horse-power per light for smaller generators. The cost of carbons consumed is about 1 1/2 cents per hour.

The Jablochkoff Electric Lighting Company controls for this country the patents (owned by the Compagnie Generale d'Electricite, of Paris, as well as a number of others issued on'y in the United States. The system may be said to be on the dividing line between the two general classes of "arc" and "incandescent" lighting. M. Paul Jablochkoff, a Russian engineer, while in Paris in 1875, turned his attention to electric lighting, and sought some simple way of avoiding the great obstacle to economy in lighting by electricity, namely, the maintaining of the extremities of the carbon pencils of arc lamps at a constant and proper distance apart. To accomplish his object he hit upon the simple idea of placing the carbons side by side, parallel, and at the same distance apart that their adjacent ends would be if placed end to end in the usual manner in a regulator lamp. As the electric current, in flowing from one pencil to the other, carries particles of the carbon across the arc, the pencil, or carbon, from which the current flows, generally known as the positive, is consumed much more rapidly than the other. In practice it is found that their rates of consumption are as two to one. For this reason Jablochkoff made use of a positive carbon having double the cross section of the negative, to compensate for this unequal consumption. Similarly, it is still necessary to use in regulator lamps positive carbons of twice the length of the negative ones. He also made use of a thin strip of some insulating material between the carbons, to prevent their touching and to hold them in place. In practice it was found that, on account of imperfections in the carbons, they did not burn down at equal rates; but by the use of alternating currents, making successively each point of the carbons a positive and a negative pole, they were made to burn in equal quantities in the same time. When this point was reached, Jablochkoff abandoned the unequal rods cut from retort carbon, and adopted composite cylindrical carbons made by M. Carré. The insulating and supporting material, generally some substance like lime, is heated to incandescence, and gives a mellow tone to the light, avoiding the glare of regular arc lights.

The Jablochkoff candle as now used consists of two carbon pencils, 11 inches in length and 1-16 inch in diameter, tipped with thin sheet brass at the bottom, and held in place at a fixed distance apart by chalk, or lime, or a mixture, pressed into a strip somewhat less than 1/4 inch thick and grooved on each side so as to fit partly around the carbons. The tops of the carbons are beveled off toward each other, and dipped slightly in a paste of gum and powdered carbon to provide a fuse to start the current from one carbon to the other. It is only necessary to slip the brass-tipped end of one of these candles between two springs which are connected to the two extremities of a suitable circuit, and we have in working order a Jablochkoff light equal in power to the light of any of the expensive regulator lamps, which have at the top a case of machinery, and one which, instead of requiring a skilled and expensive trimmer, can be attended by the most ignorant and unskilled man. There is no limit to the length of time for which a Jablochkoff lamp may be constructed to burn. Fresh carbons may be put in a lamp without in any way disturbing the carbon that is burning at the time, thus rendering it possible to keep in operation a powerful light continuously for any length of time.

The current for running Jablochkoff lights may be derived from almost any of the well-known forms of electric generators. The machines mostly in use are Jablochkoff's generator, invented for the purpose, and Siemens' alternating machine. The light can be made of any desired tint by varying the composition of the fusible material between the carbons. The company is organized with a capital of \$2,000,000, a large amount of which is held by the French company, and the remainder by a syndicate of a few New York capitalists.

The United States and Weston Company was organized in 1878, and commenced at once to develop and introduce the inventions of Mr. H. L. Maxim, relating to electricity. In 1880, the company obtained the control of the National Electric Light and Power Company, and secured the patents and services of Prof. M. G. Farmer. Control was also obtained of the Weston Company, and the Weston arc system was adopted by the United States Company as the principal system for arc lighting. The Weston arc lamp differs from others chiefly in the mechanism for feeding the carbons together, which is extremely simple and sensitive in operation. Mr. Weston's system also differs from others in the nature of the current used. The lamps work with a shorter arc or separation between the carbons, and the current is of lower electro-motive force and greater quantity than in any other system. This renders

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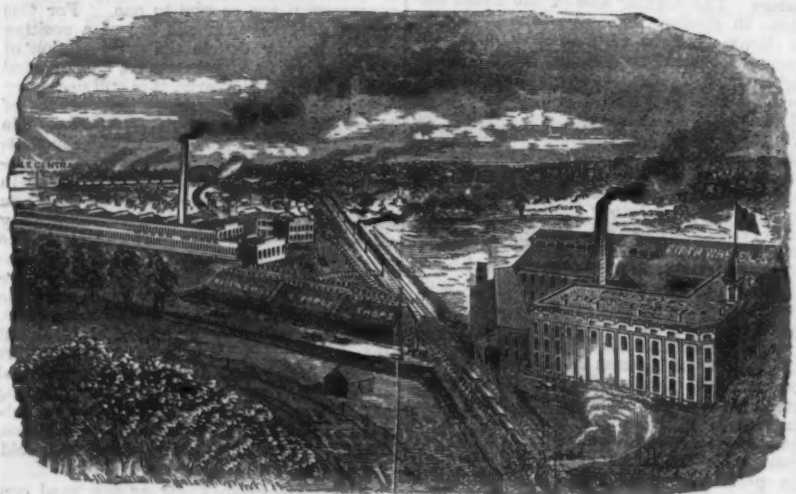


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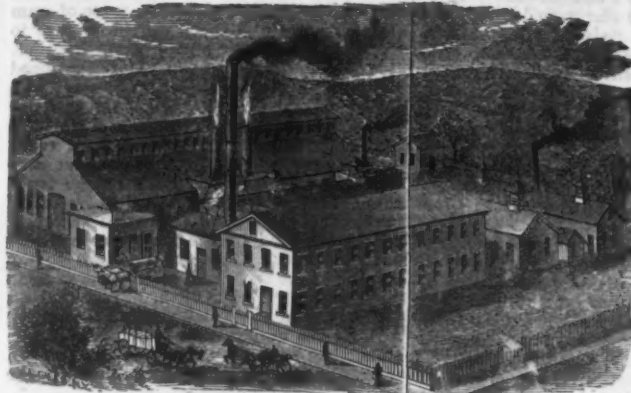


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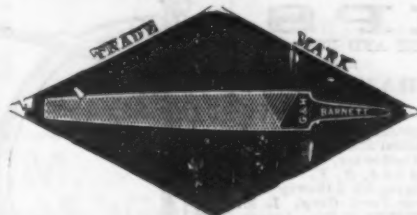
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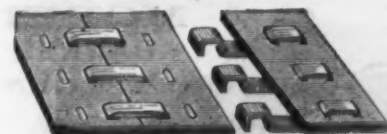
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The Cresson Iron and Steel Convention.

CRESSON, Pa., Sept. 13, 1882.

At a meeting of the Board of Managers of the American Iron and Steel Association, held at Cresson, Pa., on the 25th of July, a call was issued for a national convention of all the iron ore producers and the manufacturers of iron and steel in the United States, and of all who seek to establish in our country the manufacture of tin plate, to be held at the Mountain House, at Cresson, Pa., at 12 o'clock on Tuesday, September 12, 1882, to consider the whole question of duties on iron ore, iron and steel in their various forms, and tin plate, and to adopt a schedule of duties thereon to be submitted to the Tariff Commission for its consideration.

Pursuant to this call one of the largest gatherings in numbers as well as most complete in its representation, of these classes of producers and manufacturers ever held in the country, was in session at Cresson Tuesday and Wednesday. All parts of the country and all branches of the iron industry were fully represented. Among those present were the following:

Powell Stackhouse, Philadelphia.
W. B. Whitney, Philadelphia.
J. Wesley Fullman, Philadelphia.
Samuel Burt, Milwaukee, Wis.
John N. Glidden, Cleveland, Ohio.
Geo. H. Ely, Cleveland, Ohio.
Fayette Brown, Cleveland, Ohio.
Samuel L. Mather, Cleveland, Ohio.
Wm. E. Rider, New York.
J. W. Mumper, Barre Forge, Pa.
Samuel Lett, Yellow Springs, Pa.
E. B. Bulkley, Antwerp, N. Y.
M. Hoagland, Jr., Rockaway, N. J.
James Laughlin, Jr., Pittsburgh, Pa.
A. B. Cornell, Youngstown, Ohio.
A. McAllister, Royer, Pa.
F. A. Comly, Philadelphia, Pa.
J. King McLanahan, Hollidaysburg, Pa.
A. W. Humphreys, New York.
W. J. Taylor, Chester, N. J.
Fred'k Prime, Jr., Allentown, Pa.
J. J. Spearman, Sharpsville, Pa.
Geo. B. Berger, Newcastle, Pa.
Wm. T. Carter, Philadelphia, Pa.
Jerome L. Boyer, Columbia, Pa.
John Whitehead, Huntingdon, Pa.
J. J. Pierce, Sharpsville, Pa.
John C. Messimer, Stirlington, N. Y.
S. R. Schumucker, Williamsburgh, Pa.
W. U. Masters, Cleveland, Ohio.
A. L. Crawford, Newcastle, Pa.
W. H. Lee, St. Louis, Mo.
Geo. T. Barnes, Philadelphia, Pa.
J. G. Butler, Jr., Youngstown, Ohio.
J. H. Ricketson, Pittsburgh, Pa.
A. F. Keating, Pittsburgh, Pa.
Wm. Libby, Mauch Chunk, Pa.
Oliver Williams, Catasauqua, Pa.
Percival Roberts, Sr., Philadelphia, Pa.
Percival Roberts, Jr., Philadelphia, Pa.
John P. Verree, Philadelphia, Pa.
E. S. Wheeler, New Haven, Conn.
G. M. Laughlin, Pittsburgh, Pa.
John Z. Speer, Pittsburgh, Pa.
Philip L. Moen, Worcester, Mass.
Charles Stewart, Easton, Pa.
David Reeves, Philadelphia, Pa.
C. M. Atkins, Pottsville, Pa.
W. E. C. Cox, Reading, Pa.
F. W. Roebeling, Trenton, N. J.
A. H. Peacock, Lancaster, Pa.
R. E. Blankenship, Richmond, Va.
W. H. Wallace, Steubenville, Ohio.
George Richards, Dover, N. J.
John Slinglaff, Norristown, Pa.
Wm. H. Morris, Pottstown, Pa.
R. F. Wolfkill, Sharon, Pa.
I. Walter, Cincinnati, Ohio.
W. H. Powell, Belleville, Ill.
C. D. Hubbard, Wheeling, W. Va.
John W. Chalfant, Pittsburgh, Pa.
James I. Bennett, Pittsburgh, Pa.
Calvin Wells, Pittsburgh, Pa.
J. H. Sternberg, Reading, Pa.
W. D. Wood, Pittsburgh, Pa.
P. H. Laufman, Pittsburgh, Pa.
Alfred Marshall, Philadelphia, Pa.
Delaplaine McDaniel, Philadelphia, Pa.
Henry Whitely, Philadelphia, Pa.
W. J. Carmichael, Coatesville, Pa.
George F. McCleane, Pittsburgh, Pa.
Charles L. Gilpin, Philadelphia, Pa.
Alexander Hooven, Norristown, Pa.
F. G. Niedringhaus, St. Louis, Mo.
James H. Lindsay, Pittsburgh, Pa.
James McCutcheon, Pittsburgh, Pa.
William Clark, Pittsburgh, Pa.
John L. Kennedy, Pittsburgh, Pa.
C. C. Hussey, Pittsburgh, Pa.
D. J. Morrell, Johnstown, Pa.
Andrew Carnegie, Pittsburgh, Pa.
Thos. M. Carnegie, Pittsburgh, Pa.
John G. A. Leishman, Pittsburgh, Pa.
James Park, Jr., Pittsburgh, Pa.
Chas. H. Read, Johnstown, Pa.
Edward Rowland, Philadelphia, Pa.
Chester Griswold, New York.
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Benjamin Atha, Newark, N. J.
W. A. Sweet, Syracuse, N. Y.
O. W. Potter, Chicago, Ill.
H. S. Smith, Joliet, Ill.
W. R. Stirling, Chicago, Ill.
Thos. W. Fitch, St. Louis, Mo.
E. A. Hitchcock, St. Louis, Mo.
Cyrus Elder, Johnstown, Pa.
James M. Swank, secretary American Iron and Steel Association.
Geo. W. Cope, assistant secretary American Iron and Steel Association.
Jos. D. Weeks, Secretary Western Iron and Western Nail Associations.
Wm. E. Rider, New York.
Alfred Earnshaw, Philadelphia, Pa.
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P. G. Salom, Thurlow, Pa.
James Cartwright, Youngstown, Ohio.
Jos. P. Reed, Philadelphia, Pa.
J. H. Moulton, Ironton, Ohio.
Chas. T. Neale, Kittanning, Pa.
Hon. Arch'd McAllister, Royer, Pa.
John W. Chalfant, Pittsburgh, Pa.
H. W. Hartman, Johnstown, Pa.
John T. Wilson, Pittsburgh, Pa.
Nathan McDowell, Pittsburgh, Pa.
H. Stoner, Altoona, Pa.
Park Painter, Pittsburgh, Pa.

Most of these gentlemen, it will be noticed by those acquainted with the iron industry, represent two or more branches of the same. The number of establishments represented is more than double the number of persons present.

Mr. James M. Swank, Secretary of the American Iron and Steel Association, read the call for the convention, which has already been published in our columns.

The convention was called to order at 12 noon on Tuesday by Hon. D. J. Morrell, president of the American Iron and Steel Association, who addressed the meeting as follows:

"GENTLEMEN: The appointment by the President of the United States, in accordance with an act of Congress, of a Tariff Commission is an invitation to the industries of the country to disclose their condition and needs, and to co-operate with the Government in effecting a wise and equitable readjustment of customs duties. Through lapse of time, changes in processes of manufacture, want of clearness in the language of the law, and careless or ignorant interpretations thereof, duties have become in some instances inadequate, in others inconsistent, and in others injurious, and Congress has wisely determined to follow the example of other countries, by consulting the interests to be affected by a revision before attempting to make it. There is no intention of weakening the barriers which have shielded and developed our industries, and thus made the nation great. Our Government is protectionist, the country is protectionist, and through the wise action of the President the Government and the people are rightly represented in this respect by the Tariff Commission.

"Protection to labor, sufficient to secure our home markets to our own people, has been and must continue to be the settled policy of this country. Protection is a practical policy suited to our needs, which is adopted and enforced by all progressive countries. Free trade is the scientific vagary of closet philosophers, of no more practical value than the theory of a fourth dimension in space. It is a hypocritical pretense of our English business rivals, who are noted for their purely philanthropic interference with such trade regulations of other countries as tend to narrow the market for their products. With weak nations English methods are direct and simple. Our English rivals use fraud with Japan and force with China, but more tact is required in dealing with their brethren of the United States. Here they organize free-trade clubs, employ free-trade lecturers, circulate free-trade pamphlets, subsidize free-trade newspapers, and promote the election of free-trade members of Congress. English agents have presented themselves before the Ways and Means Committee of our lower house of Congress, and they will doubtless appear in some disguise before the Tariff Commission. "We would advise our English friends that this country is not a promising missionary field, and that their efforts are a waste of time and money, and a needless annoyance to a friendly people. The policy of protection is not on trial here. It has vindicated itself by its works. The unexampled progress of this nation, which has astonished the world, is admitted, even by Englishmen, to be due to the effective protection of our own industries; and that protection will be continued so long as the workingman of this country insists upon a higher scale of living for himself and his family than his European brother has ever dreamed of.

"Advancing to a revision of the laws in this spirit, the work of the Tariff Commission is of supreme importance and of great difficulty. The commission asks from us ample and candid information. As it strives to do equal justice to all interests, we should ourselves strive for no inequitable advantage. The success of every branch and department of our industry is necessary to the prosperity of the whole. By erroneous interpretations of the tariff law, which have ignored both its letter and its spirit, serious injury has been done to many branches. We have been obliged, as business men, to accommodate ourselves to the situation, while protesting against it, but we believe that protection is alike beneficial to us as producers and consumers. The only way to obtain an adequate supply, at cheap and stable prices, of iron ore, of pig iron, of cotton ties, of steel blooms, of steel wire rods, of tin plate, or of any other article of iron or steel, is by the imposition and maintenance of a fairly protective duty upon the competing product of foreign manufacture. The importation of any article of this nature may afford a temporary profit to some of us, but this is of trivial consequence when compared with the lasting injury occasioned by the destruction of any American industry.

"In the proposed revision of the tariff we should act in harmony to secure equal and adequate protection for the labor and capital employed in our various allied industries. No excessive duty should be claimed by any interest. The language of the law should be as clear as not to permit of misconception. Ad valorem rates should be replaced as far as possible by specific duties. The premium upon false and fraudulent classifications, which have been a fruitful source of injury, should be removed by fixing a high rate of duty in all ad valorem cases.

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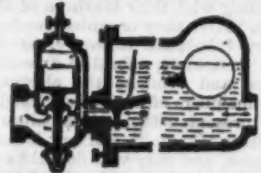
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The Amalgamated Association.

We publish in another column the letter of withdrawal from the Amalgamated Association of Mr. James H. Riley, of Pittsburgh. The importance of this letter and of Mr. Riley's action cannot be overestimated. Important as the step taken must have seemed to him, and as carefully he must have considered it, it is probable he had but little idea what this action meant. It is virtually a Declaration of Independence, and the throwing off of a burden of tyranny that not only to Mr. Riley, but to many others, has become intolerable. The significant words of the letter are those contained in the last sentence: "I am now a free man—a free American citizen." In this act Mr. Riley will not be without following. All may not take the courageous course that he has taken, and openly, over their own names, denounce the Amalgamated Association and its methods and withdraw from membership, but Mr. Riley will not be alone.

It is of interest, not only to all connected directly with the iron trade, but to all interested in the movements of labor, to analyze the reasons given by Mr. Riley for his action. It is evident, from his course, that he does not regard the several acts that have led him to withdraw from the association as mere temporary happenings growing out of the strike, and which will be removed as soon as the strike ends. He regards them as the outward indications of vicious and inherent faults in the organization. The reasons assigned for his act, tersely stated, are:

1. The refusal to permit freedom of speech and opinion.

2. The failure to carry out the contract that has existed between the members and the association by which they were to receive \$4 a week when on strike.

3. The utter disregard by many members of the association of the rights of other workmen, and those the poorest-paid class, and the deliberate attempt to reduce the wages of these laborers in order that they might aid in increasing their own.

This is a most damaging indictment, and if Mr. Riley can substantiate it and the charges under it, he has not only justified his withdrawal, but has made it obligatory on all self-respecting, conscientious men either to withdraw from the association or to reorganize it on a basis which will render such abuses impossible.

As to the first charge, Mr. Riley, who, the Pittsburgh papers state, has the reputation of being an honest, truthful man, and who has been in past years sent by the association to represent it in the conferences with the manufacturers, states, and his statement has not been impeached, that when he attempted to give his views at the district meeting, on the 4th inst. at Pittsburgh, he was hissed and booed down. He also states that a large majority of the men on strike would return to work gladly if it were not for fear of being called black sheep. It is well known that in his experience Mr. Riley is not alone. The power exercised by the association or its members in restraint of individual expression of opinion and of individual action is but little short of tyranny, and this restraint extends not only to its own members, but to all ironworkers. Members of the association do not dare express their opinion at times like this, if that opinion is against the continuance of the strike. Should they do so they are marked men and denounced as croakers and traitors. Their future peacefulness and standing is imperiled. It requires a courageous man to express an adverse opinion, and should he dare to exercise the right to work for wages that suit him, or does not completely surrender his individual freedom of thought and action to an irresponsible association, he incurs risks which few men dare to face. The out-laws of such a person, so far as his fellow-craftsmen are concerned, is complete, and it does not stop with them, but follows him into all the relations of life. As he passes along the street the women and children, who have been instructed to do so by courageous men to avoid responsibility themselves, hoot and deride him, boarding places are closed to him, washerwomen refuse to work for him, stores refuse their custom, and even the drinking saloons, that usually will sell to anybody, will not sell him liquor. His wife and children are placed under the ban. Other children will not play with them nor speak to them, and in some cases even the claims of humanity are ignored. These statements are in no degree fanciful. How honest men can be parties to such proceedings or give them their countenance by remaining members of a society that continues to permit them, is beyond our knowledge. It is perpetually a tyranny of the worst sort. We do not believe that it is necessary either to the existence or usefulness of the association. It has prospered and grown not because of these things, but in spite of them, and if the association is to continue its existence, it must be in such a form that freedom of individual thought and action will be preserved, that a man will be as free to leave the association, and without experiencing the tyrannical acts referred to, as he is to enter it.

As to the second point, the failure to give strike pay, we have already referred to this. As the association has been organized and operated, though they profess to deprecate strikes and do honestly try to avoid them, the whole administration looks to providing for successful resistance when a strike does come. Many men enter it solely for aid in time of labor troubles. Now, if it fails to

provide this aid when a strike takes place, it has failed to justify its existence, and men who entered it under these circumstances are justified in leaving it and depending upon themselves. If the association fails to keep its agreement to pay the men \$4 a week while on a strike, the men are under no obligations to continue the strike, and they have not and cannot keep their engagements in this respect. The boasts with which the papers were full prior to the strike were without the least foundation. The treasury was nearly empty, and funds have come to the general association quite slowly. But if those in the association are not bound, what obligation is there resting upon a man who is not a member of the association, who has no voice in declaring the strike or ending it, and who has not even the pittance to support him that is given to the members? There is no obligation, moral or otherwise, resting upon him, and especially if, by refraining from work he goes hungry, with his wife and children crying for bread. His obligation to those dependent upon him is infinitely more binding than any obligation he has ever taken or can take to any organization. That nail feeder who was last week arrested at Pittsburgh while stealing food for his family, not only forgot his obligation to his family, but to society and to morality, at the beck of an irresponsible organization.

As to the third point, the taking away from laboring men their illy-paid work, and reducing even the little they usually get by their competition, there can be no words severe enough to properly characterize this petty, despicable meanness. The most stinging satire of the strike is that published in the *Sharon, Pa., Eagle* some days since, which is as follows:

A Square Offer—The laboring men of Sharon called on us to-day and requested us to announce the following: We will give a cent of our wages per day to the puffers in order to induce them to go to work. Our wages are low enough now, but we will do this in order to enable the puffers to get a living by their toil and skill. LABORERS.

There is no doubt that the striking workmen have taken jobs away from laboring men. There is no doubt that they have deliberately asked the discharge of laboring men that they might get their places. There is no doubt that they have offered to work at reduced wages. Further, there is no doubt that the failure of the association to furnish funds to support the strikers has compelled some of them, in order to get food to keep from starving, to live off the grocers and bakers and butchers and boarding-house keepers, until many of these are well-nigh ruined. This may all be noble and manly, but if it is, heaven save us from such nobleness and manliness.

Now, all of these facts are known to the Western manufacturers. If it is argued that they affect them only indirectly, that their force is felt by the workers themselves, it may be answered—true, but there are modes of action of the Amalgamated in the past, at least, that have been as severe on the manufacturers as these are on the men. The mill committee, with its insolent and unwarranted interference with the running of the mill, is a method in point. This, it is claimed, has been remedied, and yet, in the face of all this, the manufacturers have treated with the Association, have recognized it, are ready to treat with it to-day on a certain basis, and openly profess no desire to destroy it.

Why is this? The Western manufacturers are not simpletons. They have the reputation, many of them, of being shrewd, careful, intelligent business men, and, conceding that this judgment of them is correct, there must be some good reason, some benefit to be derived from the association that, in spite of all the evils that are associated with it, leads them to countenance it and desire its continued existence. What are these reasons? The first is that they do not believe that these evils are necessarily inherent in the organization of labor. They believe that they grow out of all labor troubles under the present system and the relation of labor and capital, and that they will exist, union or no union. Indeed, they believe that with union they will be less bitter and less harmful than without it. They believe that had the present strike been undertaken without organization these evils would have been increased many times, and, in addition, riot and bloodshed would have accompanied them. An association like the Amalgamated is a conservator, and these evils may exist in connection with it, but not necessarily because of it.

In the second place, they believe that the association and its predecessors have been of great benefit to the men. They concede the right of organization and the right of the men under organization to get the best wages the state of trade will allow, and believe that the organization is a good offset for the human nature of the manufacturer, who, however just and fair he may be inclined to be, cannot always divorce himself from his business. The trouble at the present time is that the Amalgamated Association has been mistaken in its view as to what the market would justify.

And, in the third place, they believe that the association has been a benefit to the manufacturer. It has lessened labor troubles, furnished an organization that has given some stability to wages, and elevated in many cases the tone of the workman and the character of his work above what it would have been. They also believe that outrage will become less frequent, that the association must and will rid itself of the

odium of tyranny and allow to every one the same freedom the members claim for themselves. All manufacturers do not approve of the association, but the majority in the West do, and they look forward to the time when it will purge itself of the crimes which have thus far hampered its usefulness, and which now threaten its disruption.

The Tariff Commission.

It is greatly to be feared that the Tariff Commission, through no fault of its own, has become ridiculous. Mr. Porter's unfortunate letter, which could only have got into print through the carelessness or treachery of the gentleman to whom it was sent, administers the coup de grace to its dignity, and for the remainder of its public service as a picnic party it is likely to be regarded rather as a traveling show than as a body of economists charged with an important public duty.

This deplorable condition of affairs, which must permanently impair the usefulness of the commission and in great degree destroy the value of its final work, results, we think, from its original mistake as to the best manner of taking tariff testimony. It might have been known that if the privilege of appearing before the Commission and making arguments was extended to the public without restrictions, a very large part of the testimony offered would be of little or no practical value, and would consist merely of special pleas for or against protection, prompted solely by the individual interests of the persons making such pleas. If the whole mass of what may be called tariff testimony which appears upon the records of the Commission were carefully sifted, we venture to say it would be found that a very small part of it had any value whatever as a guide to the intelligent consideration of the question of a readjustment of duties. Some of the arguments have been able and intelligent, but by far the larger part of them have been made by men with no claim to recognition as exponents of the needs or interests of any one but themselves. We are well aware of the fact that *ex post facto* wisdom is the wisest kind of wisdom, and that after a mistake has been made it is easy to "discover" it, but we cannot resist the temptation to say that a body so important as the United States Tariff Commission, and one clothed with such important powers and surrounded by so much of high official dignity, might, with advantage to its work, have yielded less to the clamor of those eager to get its ear, and have restricted the right of argument before it to those coming with proper credentials showing them to be representative men in their respective lines of business, or who came by invitation of the Commission. In many of the industries of the country there are well organized national associations which would have been glad to send delegates to any meeting of the Tariff Commission, and to have presented full and statistical information as to the condition and needs of the industries they represent. Where no such organizations exist it would have been entirely proper for the Tariff Commission to have required that the appointment of committees to meet them should have been preceded by some form of public meeting, at which opportunity could have been given for an expression of opinion on the part of those whom such committees claim to represent. Of course this has been done to some extent, and we have no doubt the committee appointed to meet the Tariff Commission by the iron manufacturers assembled at Cresson, Penn., as we write, will be received with courtesy and listened to with attention, and that the resolutions adopted by that meeting, as expressing the sense of the iron trade as to its needs in the matter of protective duties, will have very great weight in shaping the report of the Commission. But too many of the meetings of the Commission have been simply farces. Two of those which the writer chanced to attend in Western cities were lacking both in dignity and in interest. The rooms were crowded with a miscellaneous rabble, every man who secured the floor expounding his own crude views, and from all the testimony given it would have been simply impossible for the wisest commissioner to have gained an idea worth gaining or a fact worth remembering. It is very possible that had the Tariff Commission adopted a different policy and demanded satisfactory credentials from those who sought to appear before them, their course would have excited a great deal of ill-natured newspaper comment, and perhaps given certain cheap demagogues a chance to complain that they were unwilling to hear the truth unless presented in a way to suit themselves. But it is impossible to please everybody, no matter what the line of policy adopted, and by proclaiming that its time was too valuable to be wasted for the accommodation of unintelligent special pleaders, it would have commanded the respect and confidence of all whose good opinion they have any reason to care for.

We are not prepared at this time to say that the Tariff Commission is a failure, but we are quite sure it will inevitably be so unless it places more value upon its time than it has thus far seen fit to do. A valuable report in the shape of a harmonious, well-balanced and logical tariff of imposed duties would, of course, do much to vindicate the wisdom of the creation of a Tariff Commission, and at this stage of the proceedings we have no right to assume that such a report will not be the result of its labors. But it is

entirely within the truth to say that a large part of its time thus far has been unfortunately wasted, and that its records are burdened with reams of utterly valueless testimony. What remains of its limited period of inquiry should, we think, be employed in a very different way, and if the industries yet to be represented will follow the example of the iron trade and formulate their views as the expression of great national conventions, they will be likely to influence the commission to an extent impossible if dependence is placed upon individual arguments.

It is perfectly natural that commissioners who have been bored day after day all summer listening to the kind of testimony which has been so voluminously presented, should feel tired and disgusted, and not at all surprising that they should have reached the conclusion that a valuable result cannot be obtained by such methods of procedure; but it is of the utmost importance that they should at least respect themselves and their office, and that they should restrain any public or private expressions which are calculated to make them ridiculous in public estimation. Perhaps, however, this is more than can be expected of men so thoroughly bored and disgusted as it is reasonable to presume that the Tariff Commissioners are, and while hoping that they will vindicate the wisdom of their appointment, we think we can honestly congratulate the applicants for places on the Commission whose claims were not favorably considered by the President.

The Colorado Meeting of the Mining Engineers.

We give elsewhere in this issue a brief report of the Colorado meeting of the American Institute of Mining Engineers, which, though scarcely more than an elaboration of pocket note-book memoranda, will give the reader some idea of what was said and done and seen by those so fortunate as to be among the excursionists. Little remains to be said editorially. To those who visited it for the first time Colorado was a pleasant surprise. It has had a sudden and phenomenal development; whether its progress in the next ten years will be proportionate to that of the past ten years is a question we scarcely feel able to answer intelligently. That the people of Colorado have unbounded confidence in its future warrants confidence on the part of others, to some extent. Their courage, enterprise and satisfaction with existing conditions, natural and artificial, are in themselves elements of progress. Their hospitality is certainly exceptional, and the freedom with which their mines and reduction works were opened to the inspection of the mining engineers, shows that they are not afraid to have their resources critically examined. We also find pleasure in saying that—contrary, perhaps, to the general expectation—the visiting engineers were not met in a spirit of boastfulness or exaggeration. It was admitted on all sides that Colorado's resources, great and varied as they undoubtedly are, can only be developed profitably when skill and economy go hand in hand. There was no attempt to defend or apologize for the dishonest practices which have tainted so many mining transactions and made capitalists so suspicious of mining investments. So far as appeared, the truth was told us plainly, and the only exaggeration was of that pardonable kind resulting from an overconfidence in the possibilities of the future. A more cordial reception than that given the Institute of Mining Engineers was never tendered to the traveler, even in the Orient. Nothing was forgotten nor neglected, and at every step of the journey the tourists were the recipients of an embarrassment of attention. To say that the State of Colorado abundantly repays a visit is to tell but half the truth.

The Holley Memorial.

For several weeks past we have given more or less attention in these columns to a project which we think would most fittingly perpetuate the memory of the late A. L. Holley, and be a worthy tribute to his exceptionally brilliant professional work and his high personal character. We refer to the Holley Mechanical Laboratory, and are happy to say that the idea of founding such a laboratory has been received with great favor by those whose cooperation would do most to insure the success of the plan. We had hoped and expected that the American Institute of Mining Engineers, at its Denver meeting, would favorably consider the proposition, and instruct its committee to consider and report upon its practicability, but, after a conference with the chairman of the joint committee of the three societies, we are satisfied that a further discussion of the project at this time would be undesirable, and that only unfortunate results would attend an effort to make it, at this time, the objective point of the committee's work. While it is generally admitted that a great mechanical laboratory for carrying on the investigations in which Holley was so much interested, would, if it could be founded and maintained, be the greatest tribute which the engineering profession of the country could pay his memory, it is not well to change one's plan after work has fairly begun. We are therefore of the opinion that, desirable as a national mechanical laboratory would undoubtedly be, its attainment is only a possibility, while the collection of sufficient money to rear for Holley a

fitting monument in Central Park may be counted a probability. As this has already been proclaimed as the decision of the committee, and as a very considerable amount of money has already been subscribed for this specific purpose, the work of the committee would be greatly embarrassed by an effort to force it to a consideration of some other plan at this time. We are therefore heartily agreed with other members of the joint committee and with many prominent representatives of the engineering profession, that it is better to complete the collection of money enough to build the monument, and make that sure. After that the committee will be in a position to consider the practicability and desirability of raising \$100,000 or \$150,000 more for the larger and grander object suggested. All who knew Holley or who care to contribute in any way to the perpetuation of his name and memory will, we think, agree with this view of the committee's duty. To raise \$10,000 for a monument is, of course, a matter of some difficulty, but there is reason to believe it will be done. To raise \$100,000 or \$150,000 for a mechanical laboratory may or may not be possible, and until enough funds to build the monument are assured, an effort to go further would probably end in throwing the whole matter into confusion, and leaving us with neither monument nor laboratory. We would therefore urge all who are interested in the laboratory project to wait until a more fitting opportunity for its consideration has been reached, and we can assure them that, as soon as it can be done with safety, the joint committee of the three societies will give the project full and intelligent consideration. As the matter now stands, liberal subscriptions to the monument fund will do most to promote the success of the laboratory project.

The Labor Situation West.

The past week has been full of interest in connection with the iron strike in the West, and as a result of all the facts that have come to light, the opinion is almost universal that the end is not far off, though it may be somewhat delayed by the continued prevalence of the unwise counsels that have guided the Amalgamated Association from the inception of the strike. The chief point of interest has been the mills and association at Pittsburgh, and it now seems evident that the ultimate outcome rests with the manufacturers and workmen of that city. What the outcome will be seems certain. Work will not be resumed at the wages demanded by the association. The manufacturers are determined and united. The association is hesitating and lacks harmony, and the resumption of work cannot be long delayed.

The district meeting of the 4th, to which we referred last week, and several subsequent meetings that were held quietly, the results of which are becoming known, have been largely instrumental not only in bringing about this condition of affairs, but in making them manifest. We were correct in the surmise, in our editorial of last week, that the meeting was the most important act since the strike began. Our statement as to the probable effect of the action, which was not nearly so unanimous as represented, has proved singularly just. It did for a day or two "stiffen up some of the disaffected," and stem the current that was setting so "strongly against the longer continuance of the strike," but the belief that we then expressed that this effect would not be permanent, and that the disaffection would become more and more pronounced, has been fully justified by the event. The meeting, it is claimed, was packed, and any attempt on the part of those opposed to the strike to give their opinion was hooted and hissed down, and the vote was taken under the influence of such intimidation, but even then it was not nearly unanimous.

As a result of this meeting and the subsequent ones, there is open revolt in the association. Members who have been prominent in its councils in the past have withdrawn and offer to resume work at old rates; the finishers are organizing outside of the union; its orders are openly disobeyed; its rules violated with impunity by its members, and the disintegration that we stated in our editorial last week to be threatening the association is open and known by everybody. It was possible at this meeting for the association to have taken such action, had wise and prudent counsels prevailed, as would have united the association, filled up the gaps and made it a homogeneous body again, and at the same time have weakened, perhaps, the unity of the manufacturers' organization. The action that was taken has weakened the association, split it into sections on class and rival grounds, and strengthened and united the manufacturers. It seems that even while this district meeting was in session—a meeting that, according to representations given out at first of its action, had unanimously resolved to continue the strike—a meeting of finishers was also in progress, at which steps were taken to form an organization of the rollers and heaters separate from the Amalgamated. From the first this class of workmen have been opposed to the strike. A meeting was held in July which, it was reported, had settled the differences and bound them to the union, but it has failed to satisfy them that the strike was wise. At the district meeting on the 4th, all attempts by these men to state their views were cried down. As a result of these things, on Saturday last one of the most prominent rollers connected

with the Amalgamated Association came out openly, over his signature, denounced the Association, and professed his willingness to resume work. This letter is so important that we are justified in giving it in full.

To the Editors of the Commercial Gazette:

Having been one of the delegates to represent Central Lodge No. 6 (the banner lodge of this district for common-sense and reason), at the late district meeting of the A. A. of I. & S. W., and being deprived of the right at such meeting to finish my remarks on the subject of the strike while under discussion, being often interrupted by hoots and yells for saying what in my opinion the Lodge that elected me and the constitution the organization is working under gave me the right to say, I ask to be heard through your columns.

To the members of the A. A. of I. & S. W., I said we could no longer carry on the strike constitutionally. It is no breach of faith to say this, as every manufacturer has a copy of the constitution of the organization, and I am at liberty to quote from that constitution outside as well as inside the association. This constitution provides that unless the scale is signed on or before the last day of May (or words to that effect), the mills must cease work. That was done. It also says that after the second week (of the strike) every member of the association in good standing shall receive from the protection fund the sum of \$4 per week. Can the association comply with this requirement? If not, then the A. A. of I. & S. W. violates the fundamental law it is working under—violates the constitution it asks its members to abide by in continuing the strike.

In the preamble to the constitution it is said there is no good reason why we should not receive a fair equivalent for our labor. A small reduction would seriously diminish the already small sums we receive and put large sums in the employers' pockets. Some of the manufacturers would appear charitable before the world. We ask, is it charitable, is it human, is it honest, to take from the laborer who is already poorly clothed and fed, a portion of his food and raiment and deprive him and his family of the necessities of life by a reduction of his wages? It must not be so. But the manufacturers are not asking a reduction now. If there is any of my remarks I would like my hearers to think over, it is just what I have said and am going to say. We have just put ourselves in the manufacturers' place when we go and take and force our labor on the already well-supplied market of the poor laboring man, by reducing him from \$1.75 to \$1.50 and \$1.25, which every person knows we have done. We have done what our constitution says must not be done.

After having thus spoken at the district meeting, a low, sweet voice whispered in my ear from the back part of the hall, shot out of a pair of good lungs through a rather large-sized mouth, loud enough for the reporters outside to hear, "D— the laboring man! It is our wages we want." Consistency, thou art a jewel! Just then shouts of "He's out of time," "Out of order" and "Out of reason," and I began to think I would go out of the window. I was not permitted to finish my speech, but would like to finish it to an interested public, with all respect to the A. A. of I. & S. W., as I have some warm friends in its ranks, and I know I bear the respect of its officers, though I must say I don't fear the wrath of my enemies among the members.

Every man has a right to sell his labor for all he can get, also to strike when he pleases for higher wages, though it be on a declining market, as long as he does not interfere with others, as long as he can stand on his own merits, and his own resources; but he has no right to try to keep other men out of work by taking their work for less wages, which we must admit has been done from the first week the strike began. These are facts which must be looked squarely in the face. We must admit the majority—and a big majority—would return to work gladly if it were not for fear of being called black sheep, the majority said last week, through the papers, the majority were tired of the strike, but he had not the majority to give his name. If their bump of individuality was large enough many would not only say likewise, but go to work at last year's scale. And they are not confined to finishing men. Puddlers are included. As for myself, I have severed my connection with the A. A. of I. & S. W., and am now a free man, a free American citizen, and without fear of the A. A. of I. & S. W., or seeking favor of the Iron Association, am ready and willing to return to my own work at last year's scale when my employers are ready for me.

JAMES H. RILEY.
Guide Roller at H. Lloyd, Son & Co.'s,
Kensington Iron Works,
Pittsburgh, Pa.

The sensation this letter caused was remarkable. The evening of the same day another roller followed in the same vein, giving the facts about the finishers' meeting, charging the packing of the district meeting on the 4th, announcing that the rollers were as dissatisfied as the finishers, and charging that the persistence in the strike had destroyed the association. The most remarkable part of Mr. McGrath's statement was the following:

During the few years that the association has been in existence we have found that it is controlled by an element which does not represent intelligent labor. The more progressive portion of the organization has been forced into measures against their better judgment, and this strike has proved that the intelligence of the order does not control its movement. Persisting in the present strike in the face of all reason and logic has done more toward breaking the association than the united manufacturers could have done in three years. Another objectionable feature of the association is that the mill committee treat the rollers just the same as they treat the manufacturers. This has caused great dissatisfaction among the rollers, and before long they will have an organization of their own. There will likely be no more district meetings during the present strike, as the mills will go in one by one or the puddlers may hold out alone until they are compelled to succumb.

As if these evidences of disintegration were not enough to teach them wisdom, with a blind fatality that it is difficult to account for, the Amalgamated deliberately prepared for itself another defeat. Wilson, Walker & Co.'s blacksmiths and hammermen had been at work for some time, by consent of the Amalgamated Association, and it was evident to those who were only onlookers that they would continue at work in spite of the Amalgamated. But in its blind folly it decided to use its power to make these men stop work, never seeming to realize that its power had departed. The men refused to obey, with very few exceptions, and added to their refusal a bold defiance. At a meeting of the men the following resolutions were passed:

Whereas, The A. A. of I. & S. W., has ordered us, the employees of Wilson, Walker & Co., limited, to cease work; and,
Whereas, This association has failed to provide

for us, according to its constitution, by the payment of a stipulated sum; and,

Whereas, This association has also broken faith with us by the non-fulfillment of its promises; and,

Resolved, That we, the employees of Wilson, Walker & Co., limited, remain at work, despite the order of the association; and be it also

Resolved, That these resolutions be published in the papers, as indicative of our feeling relative to the present situation.

During last week arrangements were also made to start up some departments of other mills at Pittsburgh. The steel department of Graff, Bennett & Co.'s Fort Pitt works, and Brown & Co.'s Wayne works, part of Everson, Macrum & Co.'s and H. Lloyd Sons & Co.'s either have started up or will do so soon, and the same is true of Reis Bros., at Newcastle, Pa.; Somers Bros. & Co.'s, at Struthers, and Brown, Bennett & Co.'s at Youngstown, while the Britton—not Bolton, as the types made us say last week—has started. All of these have not started non-union nor outside of the union, but all of them have started in violation of the laws of the union.

Now, all of these facts indicate a loss of power on the part of the Amalgamated that is surprising at first thought, but not so surprising in view of the unwise and foolish movements it has made. If it persists there will soon be "none so poor as to do it reverence." It is not yet too late to restore it to some degree of respect among its members, and to retain some semblance of its old power, but this can only be done by a return to its old wisdom.

Notwithstanding the present situation, it must not be imagined that the strike is yet at an end. The indications all point to a breaking up, and the end is, no doubt, not far away, but even yet there is a reserve of power in the association, and, though there is a rout, they may yet draw off a remnant and reform the lines. It must be noticed that so far there has been little falling away of the puddlers. Some have signified their willingness to resume at last year's rates, but, as a body, the puddlers so far are firm. It is evident, however, that if these do not soon arrange to resume there will be breaks here also, and, though the strike may technically proceed, the mills will, one after another, resume.

By a vote of 10 to 7, the Board of Trustees of the Brooklyn Bridge have decided to retain Mr. W. A. Roebeling as Chief Engineer. Mayor Low's motion to make Mr. Roebeling consulting engineer is thus lost, and with it much of his endeavor to bring about the needed reforms in the management of the concern. It is needless to say that the ring presented on this occasion, as always, the "solid phalanx" Mr. Roosevelt wots of. Mayor Low and his friends in the board have lost a battle, but it is too early yet for him to issue Mark Twain's classic bulletin: "We have met the enemy and we are—his'n."

It seems that we were justified in doubting that Mr. Jarrett uttered, in his Philadelphia speech, the sentiments regarding immigration attributed to him by the Associated Press. He denies that he opposed, in any manner, the immigration of foreigners who come to this country of their own volition and at their own expense. What he seems to have objected to was the coming of foreigners who were induced to come here by manufacturers, in order to overstock the labor market or to assist in breaking a strike. While any sort of a contract or coolie system cannot be too severely denounced and should be met with heavy penalties, it is difficult to see what right or power this Government has to prevent the immigration of men who may come to this country for any purpose that is not unlawful in itself, no matter who may furnish the money for the passage. If a man whose way is paid by a manufacturer shall not come because his labor will be used to break a strike or reduce wages, logically he must not come at all, even if he pays his own passage, because his labor may be used when he gets here for the same purpose. We have seen many statements lately similar to this of Mr. Jarrett. Will he or some one else tell us, just what he proposes to prevent, and how?

Captain Shaw, the chief of the London fire brigade, has been in New York City, and the New Yorkers have been showing him a thing or two. He expressed his great surprise at the speed with which the companies succeeded in getting to a fire, and the ease with which they handled their apparatus, and as he also complimented them on the manageableness of most of their apparatus, there is of course great rejoicing in consequence, and a cry of "the finest in the world." While the apparatus is, doubtless, better than that used in London, and while, on many occasions, the engines do get to fires with remarkable celerity, we think it is a little premature to cry "the finest in the world." We have time and time again seen a fire engine come tearing around a corner and halt in front of a burning building with a vim and determination that led us to expect an instantaneous extinguishment of the fire. We have, however, in these cases been invariably disappointed by the manner in which the work was carried on after the engine reached its station. The men leisurely got off from the carriage, the horses at once recovered from their fury, rubber coats were put on, and the whole party began to look about to see what was to be done or who was to give orders. There was no haste and no worry. One looking on would have supposed that such a thing as a fire was unknown, and that they had been merely speeding their horses and had come to a resting place. In this leisurely manner minute after minute often passes away, and valuable time is lost at the begin-

ning of a fire, when time is most valuable. Concerted action, too, is often lacking, and one set of men is frequently doing something to impede, or even injure, another company in their immediate vicinity. This was well illustrated at a recent fire in the lower part of the city. In snowy times, when the streets are difficult of travel, New York's Fire Department has nothing to boast of. Then two horses can barely drag the ponderous machines at a snail's pace. Captain Shaw says: "Your chief is not responsible to the public, but to a board of commissioners, and they seem to have no well defined responsibility. The discipline of the men is indifferent, as compared to the discipline of the London firemen." We think his remarks cover the case. Comment is unnecessary.

AMERICAN INSTITUTE OF MINING ENGINEERS.

Notes of the Colorado Meeting.

The Colorado meeting of the Institute of Mining Engineers was, in many respects, the most memorable of its many memorable meetings. A large attendance of members and associates, and the company of many charming ladies, gave the resident members and citizens of Colorado probably more than they expected in the way of preparations for the visitors; but their hospitality was more than equal to the demands upon them, and it is but just to say that nothing which could contribute to the comfort, entertainment or instruction of the guest, and which was, at the same time, within the range of possibility, was omitted or forgotten. It is scarcely possible, in newspaper columns, to give more than an outline of an excursion so full of incident and adventure, but even an outline cannot fail to be of interest to our readers, and especially to members who were not among the fortunate ones.

For a few of the doubly fortunate ones—some 27 in all—the pleasures of the Colorado meeting began as early as the evening of August 15th, when, in the comfort and seclusion of a brand new Pullman car, chartered for the party to run through to Denver without change, they left New York and, with a few welcome additions secured at Trenton and Philadelphia, were moved to Cresson, where an all-day stop was made. Cresson is a pleasant place, and although no one of the party was in especial need of rest just then, they took it in anticipation of fatigues to follow. Dr. R. W. Raymond, under whose management the party was organized, and who had made all the arrangements, provided for this stop-over to bring the party into Pittsburgh at an hour convenient to purchase Denver excursion tickets, offered by the railroads from that point. From Cresson the car was moved westward without accident or incident, barring the usual loss of time, until Kansas City was reached, from which point, to bring the party into Denver in time to attend the opening session on Saturday evening, the Union Pacific management granted the unusual favor of a special engine. This was, perhaps, the most extraordinary feature of the whole extraordinary trip, and to say that each member of the party felt himself an uncommon swell "for that date and trip only," would not be to exceed the bounds of truth. It is not everybody who is yanked, so to speak, over the K. P. R. R. in a chartered Pullman drawn by a special engine. Thanks to this courtesy, the New York delegation reached Denver in time to participate in the opening session, which was held during the evening of August 19th.

The Opening Session was held in the tastefully decorated hall of the University of Denver, President R. E. Rothwell in the chair. An interesting and instructive address of welcome was delivered by Governor F. W. Pitkin, which contained some very practical suggestions as to the conditions of safety and profit in mining investments, recognizing, of course, the professional importance of the accomplished and conscientious mining engineer.

President Rothwell responded fittingly to the Governor's welcome, and then proceeded to deliver the customary opening address from the chair. We regret that we are unable to publish even an abstract; but although covering much ground, it could not be readily summarized in the brief space at our command.

Sunday, August 20. was spent in rest, recreation or religious duty as the visiting members preferred. As it would not have been in good taste under the circumstances to have asked any questions, we do not know in which direction the preferences of a majority of the members tended.

Monday, August 21. It was necessary to make an early beginning on Monday, as it had been arranged that the special train which was to carry the Institute to Central City should leave the Denver depot at 8 o'clock. The start was made on time, and after a run of a few miles over the plains the foothills of the Rocky Mountains were reached, and for many the real interest of the journey began. The chief feature of the plains is the exuberant crop of sunflowers, which, though not quite so large as the sunflowers which are now cultivated so generally as decorative features of aesthetic gardens in the East, are otherwise much the same. As the foothills were entered the scenery became a matter of exciting interest, and the ascent of Clear Creek Cañon was a protracted delirium, until tired eyes refused to see and whirling brains refused to note the ever-varying, but still monotonous, panorama of red rocks which the flight of the train unfolded. But the courage of the engineers who built the railroad was an ever-increasing surprise. In point of fact, the engineering of these Colorado railroads is by no means as wonderful as it seems to be. The men who built them had a clever talent for expedients and a phenomenal indifference to curves and gradients. They seem to have started out with the idea that any place a goat could go a railroad could be built; that the radii of curves are of no great consequence, provided the trains taking them do not get tangled up or wound around rocks, and that the easiest way to get

over a hill is to climb it. While not denying to these courageous engineers the credit due them for their work, vastly more credit, we think, is due the locomotive builders. If they had not learned each year how to build engines which would accomplish what no engines built the year before could accomplish, it would have been useless to build these narrow-gauge Colorado railroads, for they could not have been operated profitably, if at all. But, notwithstanding these considerations, the Colorado mountain railroads are interesting, and their construction shows wonderful business enterprise, especially on the part of the Denver and Rio Grande management.

Clear Creek Cañon was the first revelation of characteristic Rocky Mountain scenery—viewed from below, so to speak—to which the strangers were treated. We shall not attempt to describe it for several reasons—chiefly because we doubt if any description we could write would be interesting. We lack that exuberance of language which so delights the student of guide books—especially those which describe Colorado, in one of which we read concerning one of the gorges: "Its glistening, quartz-studded, cloud-piercing walls, which seem to topple and threaten to shut together over your awe-stricken head, measure more than 2000 feet in vertical and reverberating height. Further on you come upon giddy trestles spanning black ravines, rising ever higher and higher until the sight of dizzy, swooping valleys makes you catch your breath hard, and you would gladly weigh 1000 tons so as to have some spurs in balancing the awaying train which spins so airily above them." This is the proper thing in descriptions of Rocky Mountain scenery, but we were to attempt such flights of rhetoric the reader would wish he weighed 2000 tons long enough to sit down on us. Of Clear Creek Cañon we can only say it is very grand and impressive, and was appreciated to the limit of human endurance. Black Hawk, over which the train managed to climb in some mysterious zig-zagging way, was an object of much interest, and when Central was reached everybody was glad to leave the cars, feeling that they had enjoyed being snapped around corners, whiplash fashion, for as many consecutive hours as was desirable at one sitting.

At Central City accommodations were provided for the party at the Teller House, which was reached in procession. The town turned out to see the sight, and no doubt greatly enjoyed the spectacle of a pilgrimage of "tenderfeet"—if tenderfoot has any plural—to this representative mining camp. After dinner the party separated. Some went to the California and adjoining mines, some to Black Hawk to visit the stamp mills, some to the Bobtail Mine and Bonanza Tunnel. The writer was so fortunate as to be under the guidance of Prof. George W. Maynard, for several years a resident of Central, who, in addition to being perfectly at home in that district, has a confidence in the docility of Colorado horses and the strength of Colorado carriages and harness which we cannot consider justified by the condition of Colorado mountain roads. However, nothing serious happened until the harness broke under the most favorable conditions possible, and where it occurred neither inconvenience nor delay. Had it happened at any one of twenty places on the road from the California to Black Hawk, there would have been occasion to reverse the rules in our issue of August 25.

In the evening the Opera House was well filled with visitors and citizens, and a very interesting session was held. Before the regular business of papers and discussions was taken up, Mr. J. C. Bayles offered the following resolutions of respect for the memory of the late David Thomas, of Catawauqua, first president of the Institute:

THE DAVID THOMAS MEMORIAL.
Whereas, The American Institute of Mining Engineers, desiring to place upon its records a fitting expression of regret for the memory of its first president, David Thomas, whose death at the venerable age of 83 has occurred since our last meeting, direct that the following be spread upon its minutes and spread upon its transactions:

Resolved, That in the death of David Thomas the country has lost a citizen whose life was an example of all the virtues which adorn society and strengthen the State, and whose work contributed in an unusual degree to the development of our metallurgical industries.

Resolved, That in his death, which all who knew him count a personal bereavement, the American Institute of Mining Engineers has lost a member whose name was an honor to its roll, and whose great service to the iron trade of the country in demonstrating the value of anthracite coal as a metallurgical fuel, laid the foundation of one of the greatest of our national industries.

Resolved, That we remember with pleasure that his life was prolonged so far beyond the average—that it was so rich in all that contributes to the happiness of good men—that in old age he was privileged to enjoy the companionship of his gentle wife, to whom we tender our deepest sympathies, and that his final years were blessed by filial love and the devotion of beloved friends.

Dr. R. W. Raymond, in seconding these resolutions, spoke with much feeling and tenderness as follows:

"In the absence of Mr. Mickle, who was David Thomas's associate in business and intimate friend, it falls, perhaps appropriately, upon me to say a word or two in seconding the resolutions just offered. I regret extremely that I cannot find myself better prepared to do this, and that the duty has been thrust upon me so suddenly that I can scarcely find words worthy of the subject and the place. My own connection with Mr. Thomas is known to many of you. When this Institute was formed, 11 years ago, our present president took the chair as a temporary officer as long as that first session continued, but when the committee appointed for the purpose came together to elect permanent officers for this new society, we turned with one accord to the man whose name would do more than any other name to unite, in support of our new enterprise, the enthusiasm of science with the experience of practice, and none of you who look now upon the vast prosperity of this society can realize how mighty important it was

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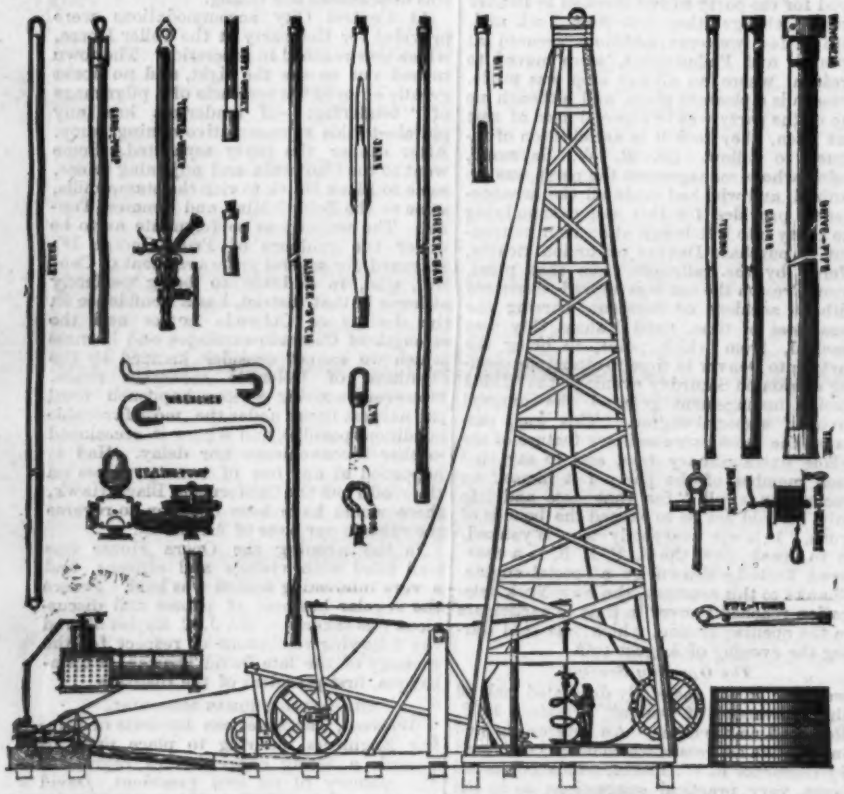
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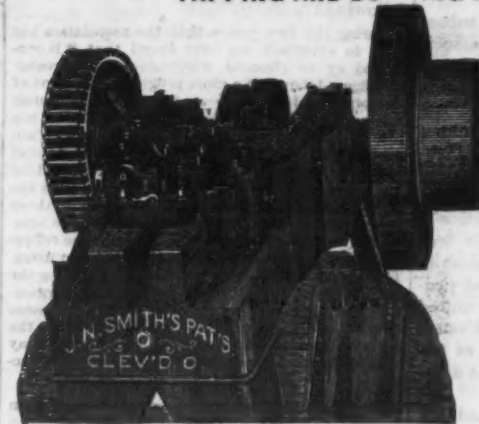
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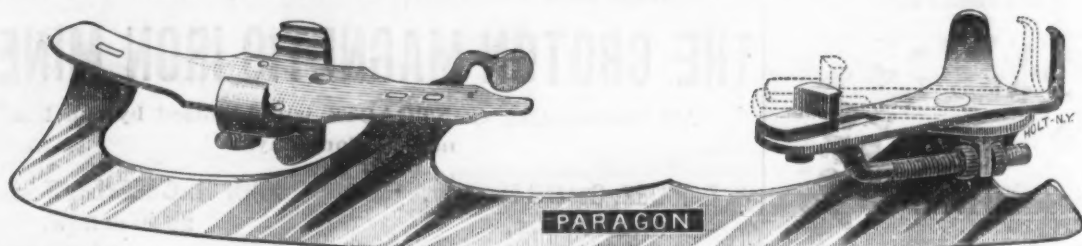
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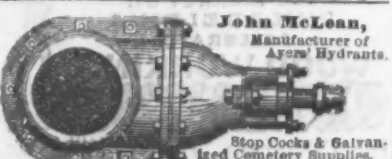
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thus to secure at the outset the combination of those two elements, the lack of either of which might have been fatal to our hopes and plans. I venture to say that no mere society of young scholastic graduates, no society of men learned in what they had learned from other men, no society of men looking down upon the hard-handed and unlettered practical operators of the country could have taken root and become strong and useful and beautiful as ours has. It was because the men who, like David Thomas, had worked from boyhood with their own hands and had come to learn from long experience the value of science and of books, and of the records and interchange of experience of other men, cordially came forward and took our weak young hands into their strong old hands, that we began from the first to win the confidence of both classes whose co-operation was so necessary to us. Mr. Thomas was then already an old man, ready to lay aside the cares and the labors of life, and well deserving the rest which wealth and comfort and friendship and assured success of every kind in life might well have bestowed upon him. But he took hold of this young enterprise with such an enthusiasm and sympathy and warmth of feeling as to inspire even his younger co-laborers. He did, indeed, make one condition, namely, that at his advanced age great physical labor should not be required of him. But those of us who attended the first few meetings of the Institute at Bethlehem, at Troy and elsewhere, will bear witness that his indomitable agility, activity and cheerfulness were such as to make his age almost a mockery; we could scarcely believe that he needed to be excused from any labor. He seemed to be endowed with all the freshness of an everlastingly young man. As I happened to be the first vice-president on the list, it fell to me to do the physical labor during Mr. Thomas's administration, and I afterward became his immediate successor. I can never forget with what kindness, constant, unvarying and cordial, he treated me in all our intercourse. But my personal relations faded into insignificance when I recollect what he has done through his whole life for the industry of this country, what was his invariable, stimulating, refreshing kindness to young men, and what was his courage and cheerfulness up to the very last.

"We know his affections were with us. And when, at last, he laid down the nominal badge of his office among us, it was with a unanimous and enthusiastic vote that we made him our first honorary member, our only honorary member of this country. We never have bested, we never shall bestow an honor better deserved."

"I can scarcely occupy time to-night with any discussion of the history of Mr. Thomas's contributions to American industry. These resolutions, while they pay him a meed of praise that is justly his due, are certainly not intended to exclude from similar praise his early co-laborers, like our worthy friend, Wm. Firmstone, who preceded Mr. Thomas into the land of shadows, but such men laid the foundation of our great industries in the East. What they wrought and what will spring from what they wrought, we can scarcely measure in words, we can scarcely picture in dreams, but now that they are gone, we, who laid them to rest, remember them rather as friends than as public benefactors."

"I am very glad, sir, to second these resolutions, and I only wish that time and more thorough preparation permitted me to do it in worthier words."

OTHER BUSINESS.

A paper by Mr. A. N. Rogers, on "The Ores of Gilpin County and their Treatment," was read by his son, Mr. E. M. Rogers. It chiefly related to stamp-mill practice, and defended the methods employed in the reduction of Gilpin County ores in the local mills from unfavorable comparisons which had been made with the California practice. Doctor Raymond, Mr. Richard Pearce and Mr. Rothwell discussed the paper with animation.

The hospitality of the citizens of Central was—well, embarrassing. Hotel accommodations, carriages and conveniences of every kind had been provided, and when bills were asked for or settlements were tendered, every one was told that the local committee had assumed the privilege of paying the bills, and that the money offered by the visitors was not legal tender under the circumstances. One act of courtesy was so exceptional as to merit special mention. Miss Brown, of Central, an accomplished amateur, had made a collection of native flowers, and each of the neatly-printed programmes provided for the ladies was embellished with a spray and blossom done in water colors. As souvenirs of the visit, these bits of art work are priceless.

Tuesday, August 22.

Early on Tuesday morning the delighted excursionists bid good-bye to their generous friends in Central, and took the special train for Idaho Springs. A few wise ones chose the better plan of riding over the mountains through Virginia Cañon—some in wagons and some astride bronchos and alleged horses. How the party on the train fared we do not know, but those who took the morning saddle ride had a memorable and delightful experience. The morning was perfect, the road was good, and the prospect from Bellevue was magnificent. At Idaho Springs the party was reunited, and proceeded by train to Georgetown, which was reached early in the day. Here they again separated, some to visit the Terrible and Dunderberg mines, but more to enjoy a ride to Green Lake, for which all the carriages and horses in the neighborhood had been secured. It probably is not true of the road to Green Lake, that "the least said is soonest mended." If so, we should say nothing, for this particular road needs mending worse than any we remember to have traversed. It would be an impossible road to any but Colorado horses and vehicles. Probably it was not as dangerous as it seemed, but it need not be to strike terror to the hearts of the bravest. However, it was passed without accident, and the beauty of the lake, not to speak of the luncheon served on the dancing platform, abundantly repaid the effort of getting there. Green Lake is a very attractive place, and we are sorry it

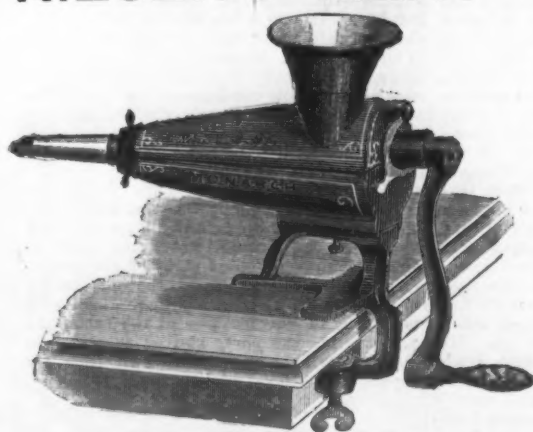
is so far from anywhere. While there the visitors were treated to a Rocky Mountain shower—the only one they saw west of Denver. It was a variegated shower—including rain, hail and a touch of snow. It did no harm, however, as at these high altitudes it is easy to get dry—in fact, dryness is a chronic condition of both residents and visitors. Fortunately the shower was of short duration, and was soon followed by bright sunshine. Leaving Georgetown quite early in the afternoon, the excursionists were conveyed back to Idaho Springs, where a stop of several hours was made to afford opportunity to accept the hospitalities of Colonel Moore and Ex-Governor Bryan. While here many of the gentlemen availed themselves of the opportunity to indulge in the luxury of a warm soda bath, one of the features of the trip. At 7.30 p. m. the party started to return to Denver, which was reached in time for supper and a good night's rest.

Wednesday, August 23.

Early on Wednesday morning the party resumed their places in the cars for the journey to Leadville. It was reached late in the afternoon, and accommodations were secured in the hotels and lodging houses before dark. We should scarcely care to venture a description of Leadville, for how one would describe it would necessarily depend very much upon how one saw it. Perhaps our description would not be recognized by others of the party, who may have seen more or less than we did, according to their opportunities. It is still called a mining camp, and the citizens seem to delight in so styling it; but it possesses very few of the features of a camp. It has a heterogeneous population of probably 20,000. Its principal streets are closely built up with substantial structures, its public buildings are commodious and solid, and it looks like a town which has come to stay. Much of what is called vice in the East is there practiced so openly, and seems to be so much a part of the daily life of a majority of the population, that the visitor scarcely knows whether his ideas of right and wrong do not need revision. There are more bars and liquor saloons in proportion to population than in any town we have ever seen, and we question whether liquor selling is not, on the average, a great deal more profitable than mining. Leadville is correctly described in one of the Colorado guide books as a "booming metropolis." The term certainly expresses the local idea very clearly. Of its future we scarcely dare venture an opinion. With nothing about it to invite residence, it will last just as long as capital flows in and mining development goes on. It is looking to the development of the Gunnison district for its next impetus in the direction of a substantial progress. As a place of residence, no one not drawn there by the chance to make a better living than could be gained elsewhere, or held there by inability to get away, would be apt to think it other than the least desirable place on the surface of the globe. With an average elevation of 10,050 feet, it is not a comfortable place to live, and nothing except children will grow on its barren slopes. It is without a source of water supply, and domestic consumption is met by enterprising purveyors, who sell water by the barrel. The town can never be attractive, and when it ceases to be curious it will become intolerable. No place we know of so well repays a visit—in no place we know of would the average man be less willing to stay, although for those who like that kind of a town it is pre-eminently the kind of a town they like.

But while far from charmed with Leadville, we carry away more than pleasant recollections of its people. Their hospitality is as unbounded as their confidence in the future of their "camp." If you ask the average citizen to tell you the direction of some point you wish to reach, he will invariably take you there instead of telling you how to go, and will insist on your having a drink with him on the way. Whether the visiting mining engineers were treated with exceptional courtesy or not, we have no means of knowing, but there are probably very few of the party who have not cause to remember an embarrassment of attention on the part of all they came in contact with in Leadville. We can also say that it is a surprisingly safe town, with a vigilant police, and that the stranger can wander about at his own sweet will, by day or by night, with greater safety than he could through a great many parts of New York. A policeman told us with evident pride that it was some time since any one had been "held up" in Leadville. "Held up" is a technical term which means a robbery preceded by a request to "hold up your hands," emphasized by giving the victim a chance to smell of the muzzle of a revolver. None of our party were "held up," nor any one else during our stay there, so far as appeared from the newspaper reports. But as showing that human nature is pretty much the same there as elsewhere, we were interested in reading that in that wooden, waterless, rainless town, two men had been caught attempting to fire a building to give the volunteer fire department "a chance for a run."

The meeting at Leadville was held in the evening in the City Hall, and was well attended—the audience comprising a great many practical miners, who stopped in to see what the M. E.'s were talking about. The hall had been beautifully decorated for the occasion. Over the platform in the center of the wall had been formed, of boughs of evergreen, the word "Welcome," while underneath were arranged a number of picks, shovels and wash-pans in the form of a trophy, emblematic of Colorado's great industry. Glass cases with selected specimens were standing along the walls of the hall, while numerous large-sized photographs of the more striking scenery of Colorado were hung around. A band had been engaged for the occasion, and varied the proceedings with music. The exercises were opened by Mr. R. Neilson Clark, who, as a preliminary measure, suggested that all the members of the Institute should acquaint the Guide Committee as soon as possible with the name of the particular mine or smelter which they wished to visit to-day. He stated that for a study of typical Leadville geology the Argentine Tunnel would be best; for an inspection of the

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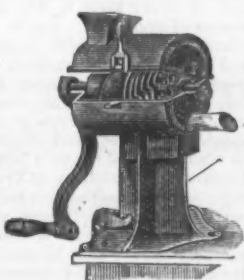
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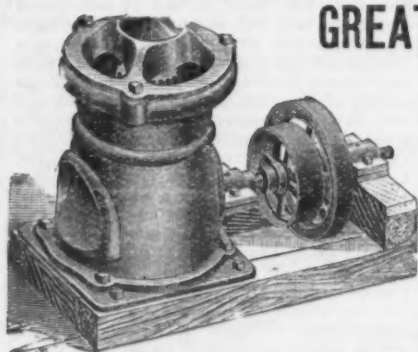


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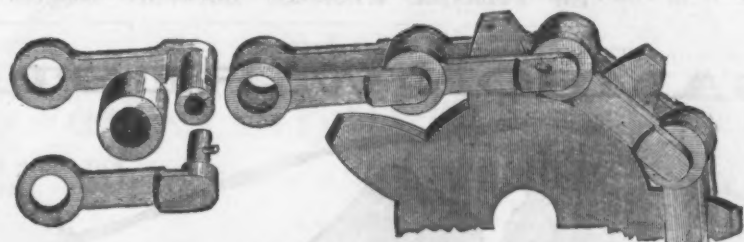
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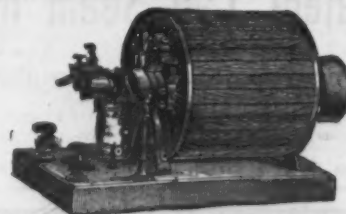
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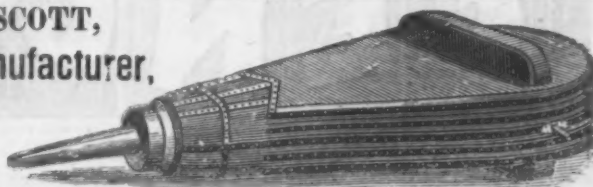
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largest body of ore in sight the Robert E. Lee; for the biggest and most complete contact vein, the Iron mine; while for a general exhibit of broken and nonconformable ore formation, the Fryer Hill mines were best. He warned the ladies, however, not to attempt to go into mines that were difficult or dangerous of access, and advised them to select such as the Iron Silver and the Carbonate. Mr. Clark further stated that after the mines and smelters had been visited, all members were cordially invited to make a trip to the Evergreen Lakes, where the glacial and moraines could be studied.

President Rothwell then invited Prof. S. F. Emmons, director in charge of the Rocky Mountain Division of the United States Geological Survey, to address the Institute on the geology of the Leadville district. Professor Emmons responded with an extemporaneous address of great interest. Copies of the maps which accompany his lately-published preliminary report on the geology of Leadville had been previously distributed, and greatly aided in following his remarks. He first alluded to the impressions made on the party when they came in sight of the Front Range, which he characterized as geologically the oldest in Colorado. Its crests were islands in the midst of an Archean sea, long before Mosquito Range or even the great continental divide were uplifted. The Front Range is entirely of crystalline formation, and in several places in Platte Cañon it can be studied to advantage and with comparative ease. While crossing South Park, on their way to Leadville, the members of the Institute could see the evidences of two special and separate submersions, during some early period of geological history, which deposited a number of strata from the Cambrian to the cretaceous and carboniferous rocks. Coming to Mosquito Range, it is very plain to see that it is of more recent formation than either the Front or the Saguenay Range. At its base there is a limestone belt of several hundred feet in thickness, in which Leadville people are more particularly interested, because in it are found the mineral deposits that have made the camp famous. Before Mosquito Range was uplifted there was a great eruption of volcanic matter in this neighborhood, which was thrust up through the superincumbent sedimentary deposits. The speaker explained here the peculiar manner of the spreading of this eruptive matter, locally called porphyry. In Leadville these porphyries spread between layers of sedimentary deposits without coming to the surface. In only a few places are they exposed by subsequent upheavals, and can be seen to advantage in the walls of several cañons. Professor Emmons then illustrated the mode of upheaval of mountain ranges by the shrinkage of the earth's crust, and the consequent faults and breaks. Around Leadville particularly there is a more complicated system of breaks than almost anywhere else in Colorado.

The speaker then proceeded to relate how the first mineral in this district had been found in places where erosion had exposed the superincumbent layer of iron in several places on Iron Hill. The discoveries of ore on Fryer Hill were accidental, as no outcrops show at all, but it is all covered by debris about 200 feet thick. Pay ore was, therefore, discovered by pure chance, while on Iron Hill both the lime and the iron cropped out, and made it comparatively easy for the prospector to find and follow the contact. Leadville's topography shows, to some extent, the location of the different faults and breaks by a corresponding depression in the surface. The geological formation of the district could never have been so correctly constructed by scientists, if it had not been for the numerous prospect holes that dot the country in all directions, and some of which penetrate to the depth of several hundred feet. A few gulches that have created deep cuts have also been of material assistance.

Professor Emmons gave it as his opinion that all metallic matter had been precipitated from above, and that it had been stopped at the surface of the limestone formation, through and into which some of the mineral matter subsequently percolated. It was a common impression that there were a number of caves in the limestone, which afterward had been filled with mineral, but this idea must be incorrect, because the caves are found to extend indiscriminately through lime and mineral both. The folding and faulting that we find in such abundance around Leadville took place at the end of the cretaceous period, but the carbonate deposits were made before that time. The present topography of the district was shaped during the glacial period. The present Arkansas Valley, from Granite up to the sources of the river, and bounded by the two great ranges, was a lake with shelving shores, into which the foot hills abutted as spurs of the surrounding mountains. There were two glacial periods, separated from each other by a warm and moist period of incessant rains intervening. During the latter glacial epoch our gulches and those wondrously majestic amphitheatres were made that we see now. Glacial gulches are easily recognized by their being comparatively straight, while gulches of erosion are always crooked. Fair examples of the two are Big Evans, a glacial gulch, and California gulch, which was made by erosion. What the miners here call "wash," is the detritus caused by the passage of glaciers. One of the largest accumulations of it around here is the big moraine ridge north of Big Evans gulch. The depth of this detritus underneath Leadville itself is at present unknown, but it is a question of vast importance to the citizens here to know if the carbonate ore deposits extend underneath our streets and further west or not. The question can only be settled by actual experiment, which, however, would be somewhat costly. The speaker then advanced the startling proposition that the Mosquito range was even at the present moment slowly rising, and the whole country being elevated in a slow and almost imperceptible manner. The ore bodies that we find here spread on the surface of the limestone formation, are by no means uniform, but show a tendency to aggregate in bonanzas, and follow no regular laws whatever. The ore is frequently in the shape of chimneys, which, however, don't at all resemble the fissure veins of crystalline rocks. The ore was first

deposited in the shape of galena and sulphurets, and was afterward converted into carbonates and chlorides by percolation and oxidation. Dykes play an important part in the aggregation of ore bodies. There is a dyke of porphyry on Fryer Hill, running nearly east and west, which has had a considerable influence on the distribution of the mineral there. It has stopped the flow at one period of its formation, and had made the ore more abundant and rich on one side and barren on the other.

Doctor Raymond took issue with Professor Emmons as to the assumption that eruptive rocks had come up from below and forced themselves between the sedimentary deposits. He did not see how the ham was able to lift the top slice of the sandwich in this fashion, and expressed his faith in the more reasonable theory that the sedimentary formations above the volcanic rocks had been deposited on the latter. Professor Emmons defended his hypothesis, and described features in the geology of Mount Lincoln and other localities which warranted his opinion.

Mr. Grabil, of Querida, followed with a paper on certain peculiar features of the Bassick Mine, which we regret our inability to summarize.

Thursday, August 24.

was spent in visiting the mines near Leadville, transportation in carriages being furnished for the party.

At the Chrysolite, on Fryer Hill, Manager R. N. Clark had, if not the lion's share of the visitors, at all events a good proportion of them. The professional visitors carefully examined the recently uncovered ore bodies of the second contact in the silurian lime. The visitors descended easily and comfortably 250 feet in a well-arranged cage, and were subsequently entertained at luncheon. At both the Matchless and Robert E. Lee mines there were numerous visitors, who were no doubt attracted by the marvelous richness of the two mines and the vast ore bodies that are exposed to view. A splendid lunch had been prepared here, which was greatly enjoyed. The representative of Manager Ward entertained the visiting guests at both the Morning and Evening Star. The large ore bodies in the former and the richness of the remaining deposits in the latter were duly admired. The Carbonate, on Carbonate Hill, had a large run of visitors, and Manager Harker had his hands full. The car truck was kept running merrily for quite a time. A nice lunch had been provided at this mine, and it had many appreciative partakers. At the Iron Silver mine, Messrs. Ahrens and Vozin did their utmost to entertain their guests. Many of the mining engineers carefully examined the great contact vein, which is certainly the best example of that kind of formation in the district. The guests were carried down the incline in commodious gigs, and as there is no mud or water in the mine, everybody was pleased and happy. There were a number of other mines which were visited by parties more or less large, and where excellent lunches had been spread for the guests, but we find it impossible to enumerate them all. Suffice it to say that the members of the Institute, after their morning trip, had a much clearer perception of Leadville, and its immense and but imperfectly developed mining resources, than they had before, and that pleasure was combined with instruction in a most agreeable manner.

At 3 o'clock in the afternoon those who were not otherwise engaged were taken to Evergreen Lakes, when, in addition to a pleasant sail, they had opportunity of studying the terminal moraines of the Mount Massive glacier.

At the evening session a paper on "Charcoal as a Metallurgical Fuel," was read by one of the members for the absent author, Mr. John Birkinbine, of Philadelphia. As we shall print it in full, we do not need to summarize it here.

Mr. R. E. Chism followed with an interesting paper on "The Patio Process, as practiced in San Dimas, Mexico."

All the strangers who took part in the Leadville meetings, especially in reading papers, found much difficulty in getting enough of the thin air into their lungs to carry them through their sentences.

Mr. Percival Roberts, in a neat speech, moved a vote of thanks to the resident members and citizens of Leadville, for their many courtesies to the visiting members of the Institute; and Mr. Clark responded, with much feeling, on behalf of the people of the city, concluding with the announcement that at the conclusion of the meeting the seats would be moved to one side, a band would appear, and those who cared to would be given an opportunity to dance.

Friday, August 25.

The morning of Friday was devoted to visiting the smelting works of Grant & Co., Cummings & Finn, the Harrison Reduction Works and several mills. The visitors to the Lady Elgin Smelting Works were delightfully entertained at lunch by Mr. J. B. Grant.

At 1 p. m. the party once more boarded their train in waiting and started for Pueblo. The journey was one of much interest, especially that portion which lay through the Royal Gorge of the Arkansas, which afforded the grandest and most impressive scenery of the tour. The train was stopped in the gorge to give the party a chance to see it more thoroughly. We again refer to the guide books for description. Pueblo was reached about 9 o'clock in the evening, and vehicles were found in waiting to carry the company to the hotels. Pueblo is a surprise. It is regularly laid out, lighted with gas and electricity, has horse railroads, telegraphs, telephones, water service, good sidewalks, and fine shade trees. The public buildings are the best in the State. There are free schools, abundant churches, two national banks, smelting works, a planing mill, rolling mill, foundry and machine shop, two flouring mills, two daily newspapers, three theatres, a board of trade, &c. The great Bessemer plant and rolling mills of the Colorado Coal and Iron Company are much too extensive and important to be briefly mentioned, and we shall describe them more fully at a more convenient opportunity.

Saturday, August 26.

The hotel accommodations provided for the party at Pueblo were the best the town afforded, but not by any means what such a town should be able to offer. However,

most of the party got supper and breakfast and slept somewhere, and were ready in the morning to visit the works of the C. C. & I. Co.

Under the able guidance of Mr. D. N. Jones, general superintendent, and Mr. A. H. Danforth, general manager, the works were fully and carefully inspected. Later in the day an abundant lunch was served, and the party were carried to the smelting works of Martin & Grist. Manitou was reached at 6.30, and in delightful hotels, provided with every convenience and many unexpected luxuries, the party, thoroughly tired out, began the 36 hours' rest so welcome and so necessary, especially after the delightful hop at the Beebe House in the evening.

Sunday, August 27.

The Sabbath was enjoyed in various ways. Some made the ascent of Pike's Peak, some went to church, some to the Garden of the Gods, some to Cheyenne Cañon. In the evening, many availed themselves of the opportunity to listen to Dr. Raymond, who delivered a lay sermon in the Congregational Church. He chose for his texts the first verse of the first chapter of Genesis, and one of the beatitudes—"Blessed are the pure in heart, for they shall see God." He traced the influence of modern scientific investigation on scriptural interpretation and, if we are not mistaken, cut out a good deal of work for the regular pastor, who, we suspect, is not in the habit of preaching the gospel according to science. Dr. Raymond's address was a delightful, simple exposition of the harmony of truth with truth, of discovery with revelation. It was listened to with appreciation and profit.

Monday, August 28.

Early Monday morning most of the party took cars to Denver, the plan providing that the day should be spent in the Exposition. Some, however, remained behind to enjoy the comforts of the hotels or to climb Pike's Peak. The train was run into the Exposition grounds about noon, and the party were heartily received. Commissioner Adams delivered a pleasant address of welcome and extended an invitation to lunch, which was served promptly. After this the visitors scattered to examine the exhibits, returning to Denver in the rain as it suited them.

The concluding session of the meeting was held Monday evening, and after some routine business, Mr. David Williams, of New York, took the floor. He called attention, in a brief speech, to the unexampled hospitality and kindness which had everywhere been extended to the visitors, and offered the following as expressing the sense of the meeting:

Whereas, The entertainment provided for the members of the American Institute of Mining Engineers in Colorado, and the hospitality with which we have everywhere been received, have placed us under unrepented obligations; and,

Whereas, We cannot but feel the inadequacy of such thanks as we can offer, and trust that our appreciation of the favors we have received will have opportunity to find expression in the hospitable entertainment of members visiting us in our respective homes, we still desire to place upon record a formal expression of our thanks. Therefore, be it

Resolved, That our thanks are especially due to the Local Committee and Citizens' Committee at Denver, for what they have done and are still to do for our convenience and pleasure.

To the proprietors of the Windsor Hotel, for the use of their club room.

To the Denver Club, for hospitality and courtesy.

To the Union Pacific Railroad, for transportation to Central City and Georgetown via the Colorado Central, and to Leadville via the Central and South Park railroads.

To the Local Committee at Central City, for entertainment at the Teller House and the use of their opera house.

To the mine and mill owners at Central, Black Hawk and neighboring points.

To the Local Committee at Georgetown, for carriages and entertainment, and to the proprietors of the Terrible mine.

To Hon. T. B. Bryan and Col. William Moore, for entertainment at Idaho Springs.

To the Local Committee and citizens at Leadville, for carriages and courtesies and the use of the City Hall.

To the mine and mill owners of Leadville, for the privilege of inspecting their works and for generous entertainment.

To the Colorado Coal and Iron Company, for showing their works and for entertainment; to Messrs. Mather & Geist, for the invitation to inspect their works.

To Dr. William A. Bell and Mr. Thomas C. Parish, for courtesies rendered at Manitou in arranging for our accommodation.

To the officers of the National Mining Exposition at Denver, for their invitation to visit the exposition, and for the collation provided.

To the proprietors of the smelting works at Argo.

To Dr. Moore and the Denver University for courtesies extended.

To the citizens and owners of works at Golden.

To the Denver and Rio Grande Railroad Company for transportation from Leadville to Denver, and for the offer of reduced rates to several points of interest on the line of their road.

To Messrs. Rinehart & Snider for the invitation to visit the Cave of the Winds at Manitou.

Resolved, That in tendering our thanks to those named, we feel that we have omitted many who might with propriety be included, and the secretary is hereby instructed to formally thank, in the name of the Institute, all whose kindness has placed us under obligations.

Resolved, That while we congratulate our local members on the brilliant success of their efforts to make this a memorable meeting of the Institute, we would say that we feel especial pride in claiming them as members, knowing that the high respect in which they are held by their fellow citizens has given the Institute an added dignity and importance in the estimation of the people of Colorado.

Resolved, That we shall cherish the memory of this visit to Colorado as among the pleasantest and most profitable experience of

our lives; and that with the idea of natural wealth surpassing estimate; of enterprise almost exceeding belief; of scenery which defies delineation or description, we shall always associate the remembrance of a hospitality, even more than these unlike anything we have ever before known or experienced.

Mr. James Park, of Pittsburgh, seconded the resolutions in a neat speech, and they were carried with enthusiasm.

Tuesday, August 29.

The forenoon was spent visiting the Boston and Colorado Reduction Works at Argo. These were of exceptional interest, and under the guidance of Senator Hill and Mr. R. Pearce, were carefully examined. From here they were taken to Golden and shown the industries of that city, which somewhat lacked interest by comparison with the Argo works.

In the evening Colorado hospitality culminated in a complimentary banquet to the visiting members at the Windsor Hotel. It was one of the most important events of the kind ever known in Denver, and it is probable that such liberality of provision in the way of food was never before seen in a banquet hall. Course after course—each one a hearty meal in itself—taxed the capacity of the company. The tables were beautiful and the service admirable. As a dinner it was a monumental success, but perhaps what we of the membership have learned to call "the afterglow" lacked something of the interest which usually attaches to the toasts and responses at the Institute subscription dinners. There were other reasons for this than the character of the speeches, which were good. During the dinner the ladies were guests at a reception tendered by the ladies of Denver elsewhere in the hotel, but it had been arranged that when the speaking began they were to be brought in and provided with seats so that they might hear it. Now, success in an after-dinner speech depends upon several things. What is said is one element, how it is said is another, but how the audience hears it is, by far, the most important consideration. An audience which has partaken of a good dinner with good wine and bright conversation across and around the table, is always in a good humor, and just in the mood to be in sympathy with a speaker who discourses pleasantly. At the Denver dinner a large part of the audience had had no dinner, but came in tired, after standing around for two or three hours. They were in no mood to be appreciative listeners, and the fact that they were brought in at all led them to expect unreasonably much. Their presence, which would have added so much to the pleasure of the dinner, had an effect not unlike that of a lump of ice in a cup of tea—it chilled the company, and not even the cleverest speaker could rouse them to an active, evident sympathy with himself. Speakers and audience were both disappointed. However, the arrangement was prompted by a desire to make it as pleasant for the ladies as possible, and if they found it even restful, not one of the speakers could regret for a moment that his speech failed in exactly the particulars in which he considered it best. A great public dinner like this must necessarily lack the atmosphere of jollity which pervades the feasts of our own particular circle of brethren and sisters, and when our guests share our food as well as our fun. The citizens of Denver are to be congratulated on the magnificence of their entertainment, which certainly reflects great credit upon their hospitality and the resources of their city.

This ended the Colorado meeting, and on the morrow each pilgrim went his own way—some to further explore the State, and some to return home by such routes and at such hours as they might prefer. We are perfectly well aware that this is a very incomplete and wholly unsatisfactory account of the meeting, the excursions, and the hospitalities of the people of Colorado, but how could such an account be made complete and satisfactory?

WASHINGTON NOTES.

(From Our Own Correspondent.)

WASHINGTON, D. C., September 13, 1882.

THE DUTCH STANDARD APPLIED TO IRON.

In the official publication of the testimony of Assistant Secretary French, the misplacement of a line in the text has occasioned much amusement among manufacturers, and the learned functionary has been interrogated as to the details of his proposed regulation of the duty on iron by "the Dutch standard of color." He is represented by the types as saying: "Many years ago what is called the Dutch standard of color was adopted, and on which the iron manufacturers have pretty decided views," &c. The recent line had wandered away from saccharine subjects and crept into the Assistant's able elucidation of the perplexities of the duties on bar and plate iron, which, in fact, even the Dutch standard of color could not unravel. The advance copies have been returned for repairs. The Secretary thinks that the Dutch standard of color has had its day, and it would hardly afford the needed relief to the ambiguities of the tariff on iron.

THE LOCOMOTIVE TIRE CASE.

The Secretary of the Treasury has settled the locomotive tire case by sustaining the collector at Chicago in the following official letter, prepared by Assistant Secretary French:

SEPTEMBER, 1882.

Collector of Customs, Chicago, Ill.—SIR: This department duly received your letter of the 14th of July last, transmitting the appeal of the Chicago Tire and Spring Works from your decision, assessing duty at the rate of 45 per cent. ad valorem on certain steel blooms, so called, imported by them per steamer Dominion into Portland, Me., and thence shipped to your port under immediate transportation bond. The appraiser reports that the blooms are circular in form—are, in fact, tires or rims partly manufactured—evidently intended for use on car or locomotive wheels when fully finished, having been hammered or forged to size, with a flange on one edge. They were classified at the rate of duty mentioned as a manufacture of steel not otherwise provided for, while the appellants claim that they are dutiable at 30 per cent. ad valorem, under the pro-

visions in Schedule E for steel in forms not otherwise provided for.

The appraiser at New York reports that the practice at that port on the classification of like articles is to charge the rate of duty assessed at your port, under authority of Decision 115, dated May 8, 1863.

The Department decides to sustain the rate of duty as assessed by you, and your decision is hereby affirmed.

Respectfully, HENRY F. FRENCH, Acting Secretary.

There is a feature about this decision which at once illustrates the eccentricities of Treasury decisions. For instance, in a previous case somewhat analogous in character, the Secretary held that axles which had been forged up to the shape of an axle, though not finished, were axles, and the duty was placed upon them accordingly, that was 2½ cents per pound. The locomotive tires in question, from all accounts given of them by the appraiser, were in just as advanced a stage of completion, and yet they were admitted at 45 per cent. as manufactures of steel.

THE TARIFF COMMISSION ON THE SUBJECT.

Pending the hearing of Secretary French that gentleman remarked: We have had another long hearing as to whether "forged steel axles" for cars should be considered as a manufactured article of steel, paying 45 per cent. ad valorem, or whether it should be regarded as an axle, paying 2½ cents a pound. Commissioner Oliver observed.—That should have been a plain question. If an axle is not an axle, I cannot imagine what else it is. M. French.—But this was a forging for an axle. Commissioner McMahon.—They were invoiced as actual forgings, and we held that they were not axles until they were complete. Mr. French.—To make it a complete axle, the end must be cut off and fitted to the hub. The two things are very much alike. It was a very nice question whether the article was an axle forging or whether it was an axle. To show how nice a question is concealed under paragraph 91, I will quote: "All manufactures of steel, or of which steel shall be a component part, not otherwise provided for, 45 per cent. ad valorem. But all articles of steel partially manufactured, or of which steel shall be a component part, not otherwise provided for, shall pay the same rate of duty as if wholly manufactured." In this connection the Assistant Secretary quoted the very article of steel tire forged as nearly as could be to go on to a locomotive, but it is not finished within the provisions rating it at three cents per pound. Commissioner Oliver.—Is it not an unfinished locomotive tire? Mr. French.—It is a partly manufactured locomotive tire of steel, and if not otherwise provided for it would be so rated. But a locomotive tire is "otherwise provided for." It does not come within "all articles of steel, partially manufactured, not otherwise provided for." It is a partly manufactured article that is provided for. Commissioner Oliver.—Is it not covered in the words "or parts thereof?" Mr. French.—Because I do not think that Congress had in mind an unfinished piece of steel that might be made into a finished one. I suppose it had the same idea as when it used the words "axles or parts of axles."

WHY THE QUESTION WAS NOT SO DECIDED.

Mr. French, as stated in his testimony, presented the question to the Secretary of the Treasury, with a view of applying the principle of the axle decision to a locomotive tire, as not being an article enumerated "partly manufactured." The explanation given at the department why the rate was not fixed at 3 cents a pound as a locomotive tire, instead of affirmed at 45 per cent. as a manufacture of steel, is that no question was raised by the manufacturers, and that the only question was between the appraiser at 45 per cent. ad valorem or the rate 30 per cent. ad valorem, as "steel in any form not otherwise provided for," claimed by the importers. The question of being a locomotive tire at 3 cents per pound ad valorem was not raised. It is too late now to remedy this oversight, and the decision, from views now expressed, will stand as applied to this special invoice, but should the question be raised in the future it will be considered. The bringing of the matter up in the courts could not affect the result, as it is claimed that the court could not put a higher duty on the article, and certainly would not reduce it.

A SUBTERFUGE.

It will be observed by the letter of the Secretary, that the article which has caused so much controversy was entered as steel blooms, dutiable at 45 per cent., under the authority of an old decision in 1863, and the appraiser called attention to the fact that they were round, and had a flange on one edge; in other words, were rims or tires for locomotives or cars. It was a notorious attempt to deprive the Government of its proper duty, 3 cents a pound, and such a decision, it is thought, would not only have been consistent with the axle decision, but would have been a proper reminder of the Government's opinion of the whole matter.

THE TARIFF COMMISSION.

A number of letters have been received here from certain persons familiar with the views of the members of the Tariff Commission, which show that some disappointment has been felt at the apparent tardiness of the representative men of the manufacturing interests of the country in coming forward and explaining their wishes. It is mentioned that the iron and steel industries, for instance, present the most difficult subjects of tariff, and upon those subjects the commission should have the fullest information. It is understood, however, that there is being prepared an outline of a revised tariff, based upon the needs of American industries, which will be submitted for the consideration of the commission. In respect to the seeming indifference of manufacturers, it is explained that movements are on foot to have a general hearing after all the members of the commission have become familiar with the vastness and importance of the iron and steel interests through their visits to the principal trade and manufacturing centers. The Metropolitan Industrial League, to which allusion was made in this correspondence a short time ago, is meeting with success, and it is understood will be able to submit some important data for the consideration of the commission by the time it returns from its travels.

came from the puddlers, some say brought by Jarrett, saying: "Hold out a little longer and we will all go in together." They then took the aforesaid action.

Still later and more reliable accounts say that no definite proposition came from the puddlers, but Jarrett got the finishers to postpone action till he could see the puddlers and make general arrangement.

Office of The Iron Age, 77 Fourth Avenue,
Pittsburgh, Pa., Sept. 12, 1882.

Pig Iron.—Business has been very quiet the past week, but an increased trade is expected in the near future, although no one that we can hear of expects anything like a boom. Consumers are apprehensive that in the event of a general resumption of the mills, prices of Finished Iron will weaken; hence they will give no encouragement to any movement looking to an enhancement in the cost of the raw article. The probability is that the policy of consumers generally will be to buy only as immediate necessities require, for a time at least, and we are impressed with the belief that it would be difficult to effect a sale for future delivery unless an inducement in the shape of a very low price was offered. Foundry grades, \$23 @ \$24, 4 mos., for No. 2, and \$25 @ \$26 for No. 1; good Open Gray Forge, \$23.50 @ \$24, 4 mos.; Hot-blast Charcoal, \$23 @ \$24; Cold-blast ditto, \$25 @ \$26. While there have been no recent sales reported, it is doubtful whether sellers could be found at the general quotation, \$26, 4 mos. Standard brands are generally held higher, but there is very little call for it. Best brands of foreign would cost \$27.50 @ \$28, delivered in Pittsburgh.

Muck Bar.—There appears to be less doing, and the market is quieter, apparently, than a week ago, although prices are steady. The last sale was at \$42, cash, which appears to be the ruling figure.

Manufactured Iron.—The indications are that there will be a number of mills in operation before another week, not only here, but west of Pittsburgh, the effect of which will soon be felt East and West. That a good deal of business has been forced to competing points by the strike is well known, but our manufacturers, once they are again in condition for business, expect to regain the great majority of the old customers. Even after they start up it will require some time to work up an assorted stock. All the railroads and steamboats have been bringing more or less finished iron into Pittsburgh for some time past, consumers here being obliged to order from other points, but the indications are that this "carrying coals to Newcastle" will soon cease.

Nails.—We are now in the midst of the usually busy time in Nails, and that there is nothing doing is because there is nothing here to do with. Two of the factories, Shoenberger & Co., and Chess, Cook & Co., it is reported will be in operation within the next day or two, and Wheeling will no doubt be in full blast as soon as Pittsburgh. It is very important for our Nail manufacturers to get started up as soon as possible as the fall trade will soon be over. A few Western Nails are still being sold to the retail trade—they cost \$3.65 @ \$3.70 delivered in Pittsburgh by the car-load.

Wrought Iron Pipe.—There is a continued good degree of activity, the mills in operation have all they can do, and the indications are that this will continue to be the case until the close of the year. The mills of the National Tube Works and Spang, Chalfant & Co. are the only ones here in operation, but it is probable those of Byers & Co. and Rhoads & Vandergrift will not be idle much longer. Prices remain unchanged at 57½ @ 60 per cent. on Gas and Steam Pipe, and 45 @ 47½ on Boiler Tubes.

Old Rails.—Sales of Tees at \$28 @ \$29, and Double Headers at equal to \$33, delivered in Pittsburgh.

Steel Rails.—Business here continues very quiet, and with absence of sales we omit quotations. The mill of the Pittsburgh Bessemer Works is still idle; how long it will remain so is not known.

Blooms.—Open-hearth Blooms are quoted at \$53 @ \$55 per ton.

Steel.—As regards the merchant Steel trade there is nothing new to report; business is fair, while prices remain unchanged. Mills, with one exception, are all in operation, but none of them are working up to their full capacity.

Railway Supplies.—Spikes remain unchanged at 3¢, 30 days. Not enough doing in Splice Bars or Track Bolts to establish prices—no stock.

Scrap.—Wrought Scrap is still quotable at \$27 @ \$28 per net ton; Wrought Turnings, \$18 @ \$20; Old Steel Car Axles, \$40 per net ton; Old Car Wheels, \$27 @ \$28, gross; Steel Rail Ends, \$27.50 @ \$28; it is said they cannot be laid down here from the seaboard much under \$29.

Coke.—Prices have been reduced to \$1.25 per ton, free on cars at ovens, in a regular way, and \$1.40 @ \$1.50 is charged for small foundry orders.

Window Glass.—Business is reported dull for the season, while prices remain unchanged.

CHICAGO.

Office of The Iron Age,
36 and 38 Clark Street, cor. Lake Street,
Chicago, Sept. 11, 1882.

The demand for Shelf and Heavy Haul ware during the past week has been fairly active and the market firm.

The Chicago Lock Co. will remove from their present quarters in this city to Grand Crossing, the premises now occupied being too small for their business.

We have received the following circular:

165 and 165 Lake Street,
Chicago, Sept. 11, 1882.

For the benefit of our patrons, and in answer to numerous inquiries, we take this means of notifying them that we have in preparation our annual catalogue, containing new lists and discounts on our goods, which will be issued about October 1.

Yours respectfully,
S. H. & E. Y. MOORE.

Office of the CALUMET IRON AND STEEL CO.,
57 Dearborn Street, Chicago, Sept. 15, 1882.

We take this means of announcing to our patrons that we will, on or about the above date, occupy our new and commodious suite of offices in the new First National Bank Building, corner of Dearborn and Monroe streets, our present quarters having become entirely inadequate for the constant increase in our business. We would call special attention to the fact that we are now making a superior quality of Open-hearth Steel, which we heartily recommend to our patrons, and assure them that we shall maintain the high standard of excellence of our Pig and Merchant Bar Iron, Nails, &c., as heretofore.

Yours respectfully,
D. C. BRADLEY, V. P. and Gen'l Mgr.
J. M. BROWN, Secretary.

Pig Iron.—The demand for Lake Superior and other Irons has been very fair during the past week, the softer grades being considerably stronger in tone than a week or two back. Scotch imported remains firm at our quotations, otherwise we have no change to note, and quote: Lake Superior Charcoal, Nos. 1 and 2, \$27; No. 3, \$28.50; and Nos. 4, 5 and 6, \$28.50; Calumet, \$25.50; Briar Hill, \$27; Silvery Soft, \$24 @ \$26; Crane, No. 1, \$28; No. 2, \$27; Himrod, \$26; Thomas, \$28 @ \$29; Imported Scotch, \$28.50 @ \$29.50, and American Scotch, \$24 @ \$26.

Scrap Iron.—The market during the week has been steady, with some speculative inquiry for the better grades of Scrap, otherwise we have no change to report. We quote (dealers' purchasing prices, which are nominal): No. 1 Wrought Scrap, \$22 @ \$23, net ton; No. 1 Railroad Scrap, \$24 @ \$25; ditto Heavy Cast, \$18; ditto Sledge Plate, \$12; ditto Cast-iron Borings, \$8 @ \$9, and ditto Machine-shop Turnings, \$11 @ \$12.

Manufactured Iron.—The demand for Merchant Iron was fair during the past week; as previously reported, stocks are very much broken. Quotations continue unchanged and firm. We quote: Bar, 2½¢ @ 3¢; Angle, 4¢; T 4½¢; Beams and Channels, 4½¢ @ 4¾¢; Hoop 4¢; Sheet, Plate and Tank, 10 to 14 gauge, 4¢; 15 to 17 ditto, 4.30¢; 18 to 21 ditto, 4.60¢; 22 to 24 ditto, 4.80¢; 25 to 26 ditto, 5¢, and 27 ditto, 5.20¢. Patent Cold-rolled Shaping, dis. 20¢; Norway Iron, Original Bars, 5¢ rates; Norway Iron, re-rolled, 6¢ rates; Ulster Iron, 4½¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 7½¢ off list; Wrought Boat Spikes, 3½¢ rates.

Steel.—No change has taken place—prices are firm and demand moderate. We quote: Tool, 12¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 7¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢. Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6½¢; Eagle Plow, 5½¢; Iron Center Plow, 10½¢, and soft Steel Center Plow, 10½¢.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts.,
CHATTANOOGA, Sept. 11, 1882.

The Southern Iron and Coal region is having real autumn weather. Cool, rainy days and chilly nights have prevailed during the last week throughout the district. General trade is in fairly satisfactory condition. There is no sign of weakness in any line and very few failures are reported. Manufacturers, especially in building trades materials, are severely crowded with work in all the Southern cities, and prices for all builders' materials are very stiff.

Pig Iron.—There is nothing new or of special interest in Crude Metals. Prices are steady and transactions on a liberal scale. Birmingham reports sales to Pittsburgh parties, made possible by reason of the strike in the latter. Stocks do not accumulate, though the output is daily increasing. We quote: No. 1 Foundry, \$24 @ \$25; No. 2 Foundry, \$22 @ \$23; Gray Forge, \$20 @ \$21; White and Mottled, \$19 @ \$20; Car-wheel Metal, \$33 @ \$37.

Orea.—We quote: 10¢ Brown Hematite, 7¢ ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails are moderately steady at \$25, inquiry being mostly on shipping account, though considerable lots are used by local mills. Wrought Scrap is steady. Cast Scrap is a drug. We quote Wrought at \$23; Cast Scrap, \$13 @ \$15; Old Wheels, \$28 @ \$29.

Nails.—Are very steady at \$3.60 rates for large bills. Mills are crowded with orders. Small bills from stores \$3.70 @ \$3.75.

Manufactured Iron.—Mill managers report a very brisk trade in Bar. November bills could readily be placed at \$2.55 @ \$2.60, but managers decline such offers, preferring not to sell so far ahead on a rising market. We quote at \$2.55 in carload lots: Railroad Spikes, \$3.40; Track Bolts, \$4; Fish Plate, \$3.

Coal.—We quote: Fancy Lump, \$2.50; Common, \$2; Run of Mine, \$1.50, at mills.

Coke.—We quote: Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

Steel and Iron Rails.—There is a fair demand for Steel Rails, and the market for Iron Bars is better than for some time. Several of the new Southern roads are laying Iron. We quote: Iron Bars, \$45; Steel, \$50; 30 lb Rail, \$47.

CINCINNATI.

SEPTEMBER 11.—Pig Iron.—There has been a fairly active trade during the past week at quotations. In addition to a large daily consumption of all grades, some of the foundry men are making inquiry for and are placing orders for delivery through the coming six months. Within the past two weeks some grades have slightly accumulated, but the sales for later future uses will take it all. All of the furnaces that will be in blast this year are in, except those at Pittsburgh. The daily product is known, and enables reasonable estimates as to how much the output will be through the coming six months. The estimates now made of the requirements of foundries and rolling mills now in operation shows that there is now no accumulation, and that there will probably be but little, if

any. If the mills in the region of the labor strikes should require work soon, it is thought that the price of Forge Iron would somewhat improve; present prices are too low, as compared with other grades. Quotations for the past week: Best Hanging Rock Charcoal Foundry, \$28; Good, \$27.50. Best Coke Foundry, \$24.50 @ \$25; Good, \$23.50 @ \$24.50; No. 2, \$1 less. Silver-Gray Softeners No. 1, \$23; Good, \$22.50; No. 2, \$22; No. 3, \$20.50 @ \$21. Forge, \$21 @ \$23 for Coke and Stonecoal kinds; Charcoal, \$24.50 @ \$26. Cold-blast Charcoal, Carwheel, \$33 @ \$36.50; Warm-blast, \$27 @ \$34. Scrap, Wrought Country, \$1 @ \$1.30; No. 1, \$1.30 @ \$1.40; Cast, light, 50¢ @ 75¢; Heavy, 75¢ @ 90¢. Old Rails, \$26.50 @ \$27.50. Wheels, \$25.50 @ \$26.50. Manufactured Iron, \$2.60, card rate. Concessions have been made in some cases, on round lot orders, for smaller sizes.

LOUISVILLE.

MESSRS. GEO. H. HULL & CO., Commission Merchants, report to us as follows, under date of September 8, 1882: There is a moderate demand for Hot-blast Irons. The supply is equal to the demand, but there is nothing pressing on the market, and prices in consequence are firm. The supply of Car-wheel Irons are still in excess of the demand, and prices on this grade are not so firm. We quote for cash, in round lots, as below:

FOUNDRY IRONS.
No. 1 Hanging Rock, Charcoal..... \$28.00 @ 28.50
No. 2 Southern, Charcoal..... 25.00 @ 26.00
No. 1 Hanging Rock, Stonecoal and
No. 2 Southern, Stonecoal..... 24.00 @ 24.50
No. 1 Southern, Stonecoal and Coke..... 24.00 @ 24.50
No. 2 " " " "..... 23.00 @ 23.50
American Scotch..... 23.00 @ 23.50
Open Silver Gray..... 21.50 @ 22.00
Close Silver Gray..... 20.00 @ 20.50

MILL IRONS.
No. 1 Charcoal..... 23.00 @ 23.50
No. 1 Stonecoal and Coke, Neutral..... 21.50 @ 22.00
No. 2 Stonecoal and Coke, Neutral..... 20.50 @ 21.00
No. 1, Stonecoal and Coke, Cold-short..... 21.00 @ 21.50
No. 2, Stonecoal and Coke, Cold-short..... 20.00 @ 20.50
White and Mottled, Cold-short and
Neutral..... 19.00 @ 19.50

CAR WHEEL IRONS.
Hanging Rock, Cold-blast..... 33.00 @ 34.00
Hanging Rock, W. B..... 27.00 @ 28.00
Alabama and Georgia, Warm and
Cold-blast..... 30.00 @ 31.00
Central Kentucky, Cold-blast..... 32.00 @ 33.00

W. B. BELKNAP & CO., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of Sept. 9, 1882: Much to the disappointment of outsiders, neither the Nail mills nor the Rivet nor the Pittsburgh Hoop and Bar Iron mills have started up. The price of the three staples has, consequently, held very firm, and on Nails, especially, there is scarcely any quotable price, owing to the fact that none are for sale. A dispatch from Knoxville declares their inability to ship any orders at all, hence our sole reliance for supplies is on the East. With the scarcity, though, of Sheet and Band Iron, there is not, as one would expect, an extraordinary firmness in manufactured articles. We may note a decline in some lines of hardware, though in the case of others that have been abnormally low, such as L. P. Butts, there has been an advance. Goods in combination are firm, the Tack men seeming to have it all their own way. Trade is unquestionably a little late, and the great crops of this region are being marketed unusually slow. We quote: Bar, \$2.60 @ \$2.75; Heavy Sheets, \$3.65 @ \$3.75; Nails, \$4; none on hand.

ST. LOUIS.

MESSRS. HOFFER, PLUMB & CO., Pig Iron and Iron Ore Merchants, 417 Pine street, report to us as follows, under date of Sept. 9, 1882: The market still remains unchanged. Quotations, for cash, are as heretofore:

HOT-BLAST CHARCOAL.
Missouri..... \$24.50 @ 25.50
Ohio..... 25.00 @ 26.00
Southern..... 25.00 @ 26.00

COAL AND COKE.
Ohio..... 24.00 @ 27.00
Southern..... 24.00 @ 25.00

MILL IRONS.
Red-short..... 23.00 @ 24.00
Neutral..... 21.00 @ 22.00

CAR WHEEL AND MALLEABLE IRONS.
Missouri..... 27.00 @ 28.00
Southern..... 30.00 @ 31.00
Ohio..... 28.00 @ 30.00

RICHMOND.

MR. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows, under date of September 11, 1882: Continue to quote this market without change in prices, and fair business doing.

No. 1 Scotch Pig Iron..... 26.00 @ 28.50
No. 1 Anthracite Pig Iron..... 25.00 @ 28.00
No. 2 " " " "..... 24.00 @ 26.00
No. 3 " " " "..... 23.00 @ 25.00
No. 1 Virginia Coke Pig Iron..... 24.00 @ 25.00
No. 2 " " " "..... 23.00 @ 24.00
No. 3 " " " "..... 22.00 @ 23.00
White and Mottled..... 19.00 @ 21.00
Virginia Charcoal C. B. Wheel Iron..... 32.00 @ 35.00
Old Rails..... 27.00 @ 28.00
Spring Steel..... 20.00 @ 21.00
Cast Scrap, No. 1..... 19.00 @ 21.00
Richmond Refined Bar Iron..... 27.00 @ 28.00
Horse Shoes (Tredegar)..... 4.50 @ 5.00
Mule..... 5.50 @ 6.00
Virginia Coke White and Mottled..... 18.00 @ 21.00

BALTIMORE.

W. N. WYTHE, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Sept. 11, 1882: We have to report a good fair average trade doing, and which would be largely increased if stocks were more promptly obtainable. Values seem firm and unchanged at annexed figures:

Ref. Bar Iron, 1 to 6 x 3/4 to 1..... \$2.60 @ 2.70
" " 1 to 6 x 1/2 to 1..... 2.60 @ 2.70
" " 1 to 6 x 1/2 to 1, Round..... 2.60 @ 2.70
and Square..... 2.60 @ 2.70
Hoop Iron, 1 1/2 to 1 1/2 in. wide..... 3.30 @ 3.40
Band Iron, from 1 1/2 to 6 in. wide..... 3.30 @ 3.40
Horse-shoe Iron..... 3.30 @ 3.40
Norway Nail Rods..... 3.30 @ 3.40
Black Diamond Cast Steel..... 12 @ 13
Machinery Steel..... 6 @ 7
Wrought Scrap, No. 1..... 5 @ 5.50
Common Horse Nails..... 10 @ 14
Railroad spikes, 5/8 x 9-16..... 3 3/4 @ 3.50
Perkins' Horse shoes, 5/8 keg of 100 lbs..... \$4.80
Mule shoes..... 5.00

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., Aug. 28, 1882.

THE SITUATION.

As a whole, has not undergone any material alteration during the past week, although there have been trifling fluctuations in some of the open markets. The advance of the official discount rate of the Bank of England to 4% was rather rough on the speculators pure and simple, although it made no great difference to those engaged in legitimate transactions. As a matter of fact, there is a good deal less discounting nowadays than there used to be—a fact which is well illustrated by the current complaints of the great scarcity of bills in the city of London. Modern business is gradually converging upon a positive cash basis, so far as that course can be consistently adopted. There are various transactions, I am well aware, which must necessitate the employment of paper, but you may take it as a fact before the reach of controversy, that good traders do not give or take bills if they can avoid so doing. A certain class of persons, on the contrary, appear never satiated with paper. They like and thrive upon it, and seem to prefer it to hard cash. These gentlemen are very largely interdependent upon each other, and prop their friends up by means of accommodation bills to a great extent. These are the principal home supporters of the discounters. Foreign bills fall in a more legitimate channel, as a matter of course, and they, with certain other sorts of commercial paper, afford the banks a great deal of business. Money is at present tolerably easy, and is likely to continue so, unless we have a new drain of gold on our behalf. Another cause of the slightly less favorable outlook in several industries has been the stormy weather which has prevailed since the date of my last letter. A great deal of rain has fallen almost all over the country, thus preventing vigorous prosecution of harvest operations, as well as doing some harm to the potato crops. Exaggerated rumors have been circulated as to the damage inflicted upon the cereals, but I have private information from several well informed sources (confirmed to some extent by my own observations), stating that no deterioration of any moment has as yet taken place. The corn has ripened well and is mostly cut, only a few days' fine weather being needed to enable the farmers to carry their products in a dry condition. A week's freedom from rain would probably witness the ingathering of three-fourths of our cereal crops in splendid condition.

THE RESTRICTION OF PRODUCTION.

question has been a leading topic of conversation during the week, and is still open to a limited measure of discussion and argument. At the beginning of the past week some very confident statements were circulated (by interested parties in all probability) to the effect that the Cleveland and Scotch ironmasters would not renew the agreement for limiting the make of pig iron at its expiry on September 30th next. It was alleged that neither party was well satisfied with the effects of the agreement, each asserting that the other district had benefited more than itself. These rumors speedily spread, and caused heavy sales of warrants, as well as a tentative weakness of the makers' iron held by dealers. On Tuesday, however, the Cleveland ironmasters met at Middlesbrough, under the presidency of Mr. W. Hanson (of B. Samuelson & Co., Newport Iron Works), and went into the matter very fully. It was found that there was perfect unanimity of opinion in favor of prolonging the restriction agreement for a further period of six months from September 30th, 1882, provided the Scotch ironmasters would do the same. Some of those present at the meeting, indeed, favored the continuance of the limitation irrespective of the action of the Scottish smelters. The majority, however, were of opinion that joint action would be essential. On the following day, Wednesday, the Scotch ironmasters held a meeting at Glasgow to consider what steps they should take in view of the resolution forwarded to them by their Cleveland friends. There was a long and animated discussion, the meeting being almost, but not quite, unanimous in favor of continuing the arrangement. Some few of the Ayrshire masters seemed to desire to increase their output by relighting more furnaces, but they were induced to give way, and finally only one dissentient remained obdurate. This was the representative of the Shotts Iron Company, who desired to consult his directors prior to agreeing to the new arrangement. The meeting was, therefore, adjourned for one week to permit of the Shotts Company making up its mind. There seems to be little doubt that the restriction will be continued, but whether for three or six months is not yet clear. You will probably remember that it was commenced on October 1st last, and was, roughly, equal to about 12½ per cent. upon the then rate of production. Since that date prices have improved all round, and stocks have gradually decreased, although in Scotland there are still 50,000 tons more than the quantity in Connal's stores a year ago.

THE IRON MARKETS.

have been steady, as a rule, but at the beginning of last week prices dropped, owing to causes already referred to. At Glasgow warrants fell several pence, and were very largely sold, but later in the week the renewed negotiations for restricting the production, coupled with very good shipping returns, brought about a stronger feeling, and buying for a rise was again indulged in. The quotations for Scotch makers' brands underwent similar changes, chiefly as regards the holdings of dealers, some of whom reduced their figures quite 1/4 @ 1/6 below the smelters' own prices. There is now more uniformity, and it is understood that the furnace owners are doing the bulk of the business in their own classes of iron. I have made special inquiries during the week as to the

volume of business doing on United States account in Scotland, and I am assured, on excellent authority, that current purchases for America are on a small scale. Shipments are being made of the lots lately bought, and a few parcels are being sent on speculation, which the extremely low rates of freights encourages, but the traffic is by no means equal to the expectations of sanguine persons. That it is unlikely to assume larger proportions seems to be certain, judging from the tenor of press and private cables received during the week from your city. At Middlesbrough there is a quiet market at the moment, with No. 3 on offer at 44/3 prompt, and 44/6 @ 44/9 next three months. Some of the merchants go a few pence below these rates, but their transactions are not sufficiently large to affect the general average. Shipments are extremely heavy from the Tees, Tyne and Wear, and will be much in excess of those for July when the end of August arrives. They have averaged about 2500 tons per working day so far, but have not included anything of note on American account. By the end of the month stocks will have fallen some 10,000 or 12,000 tons, and makers will be placed in a proportionately stronger position, hence prices are not likely to retrograde, especially as the local consumption is growing heavier. On the West Coast hematite ores and pigs are stiff, the latter being openly quoted at higher rates. About 59/ @ 60/ are named by vendors, but I take 58/ as an actual price, particularly as I know, beyond question, that offers are being made to Sheffield buyers of considerable lots at 65/ @ 67/6 per ton for equal proportions of Nos. 1, 2 and 3 at 65/ @ 67/6 delivered, net cash, up to June, 1883. The carriage from the West Coast district is at least 8/ per ton, so that those who quote 62/6 for next year's deliveries are evidently a little ahead of the facts. At the same time the market is very strong, shipments large, and the reserve stock decreasing, being now about 67,000 tons in stores only. Makers themselves have little or nothing stacked in their yards. Fresh American inquiries for these pigs—as well as for spiegeleisen—are reported on the West Coast and in South Wales, but only small lots have been disposed of, so far as I am aware. There are also inquiries for blooms, crop ends, old rails and scrap, but the offers made from your side do not meet the views of holders here. Old rails are scarce, and a few lots offered by tender by English and Irish railway companies have been withdrawn. In blooms your offers are about £5. 4/., c. i. f., for early shipment, but makers want £4. 15/., c. o. b., equal to about £5. 10/., c. i. f., New York or Philadelphia. Steel rails are easy at £5. 5/ and upward, according to section. Inquiries from the United States for 35-pound "Sandbergs" have been sent round, large tonnages being mentioned, but the offers were lower than any of our manufacturers could accept. For Halifax, N. S., there are inquiries relating to 56-pound sorts. A Sheffield concern has just finished an order for 12,000 tons for the East Indian railways, as well as a lot of 10,000 tons for the New South Wales Government lines. An order for 33,200 tons rails and 1,400 tons fish plates has just been secured by Mr. Cleve, a Melbourne broker, from the Government of Victoria, on behalf of a syndicate formed here to carry out the contract. According to a cable in the *Ironmonger*, the price is £6. 11/6, delivered at Melbourne. Freight from English or Scotch ports to Melbourne, by sailing vessels, are about 20/ to 22/ per ton, so that the price at the works will not exceed £5. 5/ if it reaches it. The same house is turning out 2500 tons weekly of rails for home lines and billets for local use. It may interest you to know that rolled billets of ordinary carbon, 3 x 4 inches, are £6. 7/6 @ £6. 10/ per ton, and "special" sorts, £7. 7/6 @ £7. 10/. For hammer-drawn billets of the same dimensions, the price is £7. 7/6 @ £7. 10/, ordinary, and £8. 7/6 @ £8. 10/, "special." In old railway leaf spring steel, there is a limited American business doing at £5. 3/ @ £5. 5/ per ton, e. i. f., New York, and 2/6 more to Philadelphia. Iron rails are completely nominal at £5 7/6 per ton, and are neglected. Manufactured iron is firm but unchanged at late rates. Sheets are stiff, but galvanized iron and fencing wire are a trifle easier, owing to cable advices of overstocking in the Australian colonies. As regards tin plates there is nothing worthy of special note. Ordinary I. C. coils are 16/ @ 16/3 in Liverpool, but, despite a good American demand, prices do not appreciably stiffen.

SCOTCH PIG IRON.

has been somewhat uneven, but with a very good turnover in most of the best known brands. Warrants have fluctuated up and down several pence on the strength of the rumors industriously promulgated by the bulls or bears, respectively, to suit their own views and aims. Makers' brands at the time of writing are a little easier, but the shipments compare most favorably with those of the corresponding period of last year, and the local consumption is fully sustained. It is probable that an advance will be established so soon as the restriction business shall have been decided. In Connal's stores there are 630,463 tons (a decrease last week of 515 tons), against 577,232 tons this date last year, and 627,186 tons at Christmas, 1881. Scotch shipments to date have been 406,435 tons, an increase this year of 48,154 tons, while importations into Scotland of Cleveland Pig have been 143,096 tons, a decrease of 45,364 tons. There are 109 furnaces at work in Scotland, against 119 a year ago, and Warrants are 50/3, against 46/3. Writing from Glasgow, on August 25th, James Watson & Co., said: "The Iron market here has been comparatively steady this week, with only a moderate business transacted between 49/9 and 50/4, cash, closing this afternoon with sellers at 50/3 per ton. The demand continues good both from shippers and local consumers. The shipments last week were 14,085 tons, as compared with 10,965 tons for the corresponding week of last year." We quote:

	No. 1.	No. 2.
G. M. B., at Glasgow.....	58/	59/6
Clyde.....	55/	58/
Coltness.....	65/	56/6
Langloan.....	61/6	56/
Gartsherrie.....	61/6	56/
Summerlee.....	62/6	53/6
Calder.....	62/	53/6
Carbroe.....	55/3	58/

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Diam. of Screw.	Height.	Net rise.	Whole height.	List Price.
1/4 inches.	10	4	14	\$2.50
3/8 "	12	5	17	3.00
1/2 "	14	6	20	3.75
5/8 "	16	7	23	4.00
3/4 "	18	8	26	4.25
7/8 "	20	9	29	4.50
1 "	22	10	32	5.00
1 1/8 "	24	11	35	5.50
1 1/4 "	26	12	38	6.00
1 3/8 "	28	13	41	6.50
1 1/2 "	30	14	44	7.00
1 3/4 "	32	15	47	7.50
1 7/8 "	34	16	50	8.00
2 "	36	17	53	8.50
2 1/8 "	38	18	56	9.00
2 1/4 "	40	19	59	9.50
2 3/8 "	42	20	62	10.00
2 1/2 "	44	21	65	10.50
2 3/4 "	46	22	68	11.00
2 7/8 "	48	23	71	11.50
3 "	50	24	74	12.00

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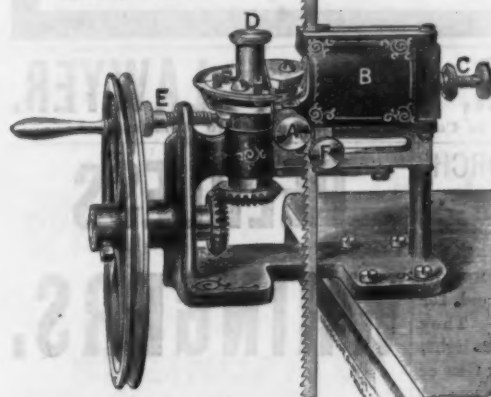
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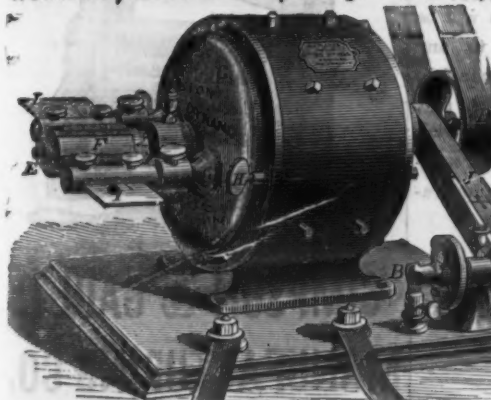
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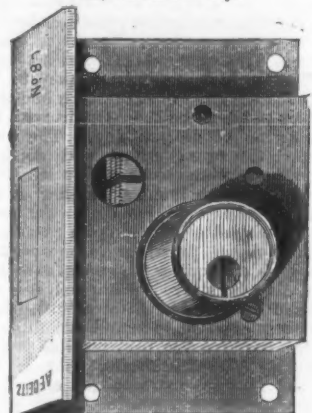
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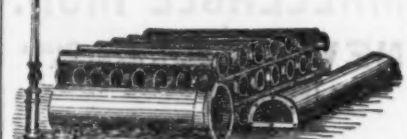
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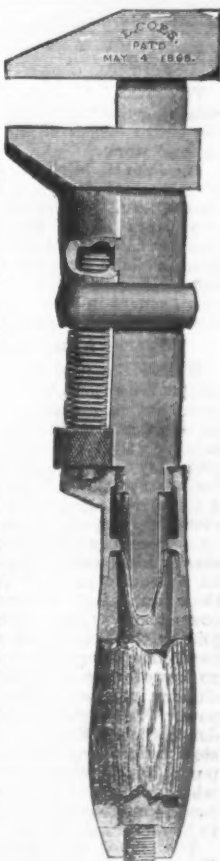
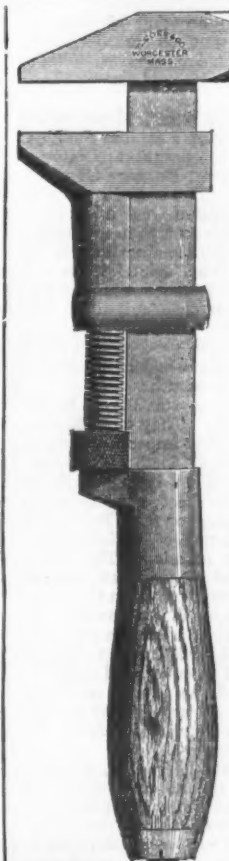
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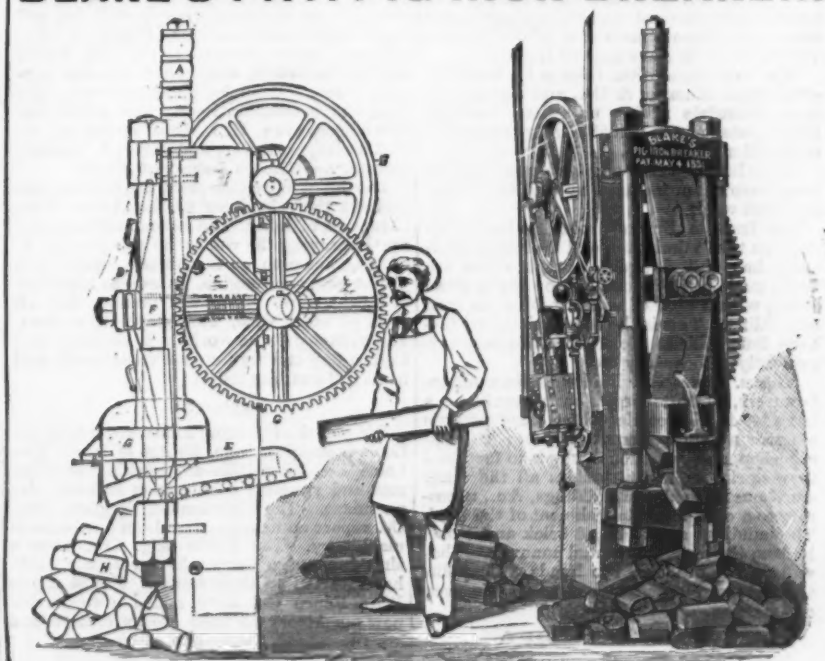
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INDUSTRIAL ITEMS.

CONNECTICUT.

The Northfield Knife Company are again enlarging their factory, adding another story to the entire length of the main building for cutlery's work.

Mr. John H. Wright, of Bridgeport, manufacturer of lathes, planers, drilling machines, &c., commenced business about two years since, and succeeded Messrs. Wood & Light. He at once made several improvements in the patterns possessed by this firm, and from the start met with great encouragement in business. Orders, for a time, were beyond his capacity to fill.

MASSACHUSETTS.

During the past twelve months the Worcester Wire Company, at South Worcester, have put on an addition to their establishment of a machine and carpenter shop of brick, 80 x 50 feet, and three stories high; and they recently extended their annealing house 50 feet, and have also just completed a one-story frame building, 80 x 50 feet, for storage. The main structure of the company now presents an unbroken brick front, three stories high and 500 feet in length, besides an extensive brick building in the rear for their annealing department. The works cover about 175,000 square feet of land, adjoining the Providence and Worcester Railroad. The company manufacture daily about 20 tons of wire of all sizes. Their new machinery includes, besides the new 300-horse-power Greene steam engine from the Providence Steam Engine Company, and three steel boilers, put in last fall, a new duplex pump, for forcing water against pressure, which has just been introduced. It will be used to make power for the hydraulic cranes to be used in the annealing house.

The Ames Manufacturing Company, of Chicopee, have lifted the mortgage of \$200,000, which has rested on their property since 1878. All trace of the recent embarrassment of the company, which was due to the continued depression of their line of manufactures, is now removed, and they will soon furnish employment to a large number of skilled mechanics. The company contemplate manufacturing sewing machines more largely than heretofore, besides having a large contract on hand for tricycles for the Overman Wheel Company.

The orders received by the Boston and Sandwich Glass Company, at Sandwich, during August, were \$8000 larger than in the same period last year.

PENNSYLVANIA.

The Glenmorgan Iron Works, of Lewistown, have two furnaces known as Nos. 1 and 2. No. 1 chilled in the early part of July, and with a very large salamander, which has recently been blasted out. At the time that No. 1 chilled No. 2 was out of blast, but blew in again a short time afterward. This furnace had the misfortune to chill during the early part of August, but not having much of a salamander it was again in operation in a short time. A second chilling occurred about the 1st inst.

The Logan Furnace, Lewistown, is doing well for a furnace of its size, and is making from 80 to 90 tons of iron per week.

Magee & Co. have disposed of their machinery in the Brownsville rolling mill, and have bade that sequestered hamlet a long and lasting farewell. Dry rot seems to be playing sad havoc with that village.—*Connellsville Courier*. If this is so, Magee & Co. have given up very suddenly. When they shut down a short time ago, they manifested no intention whatever of leaving the business.

Colebrook furnaces, which were blown out about eight weeks ago, will be lighted by Mr. Robert H. Coleman on Friday. The furnace has received numerous repairs and additions have been made to it. No. 2 Furnace will be blown in some time in November.

We understand that George H. Everson, of Everson, Macrum & Co., and manager of their Scottsdale rolling mill, has received letters patent for a valuable improvement in steel-rail manufacture.

Three hundred and eighty-five tons of pig iron were manufactured at Warwick Furnace last week.

The Isabella Furnace, near Isabella Station, on the Wilmington and Northern Railroad, has chilled again. Preparations are being made by its indomitable owner to clean it out, with a view of starting it up as soon as possible. This is the fourth time the furnace has chilled. Colonel Potts's motto is evidently "Never say die."

Messrs. Duncan & Baldwin, stove manufacturers, of Pittsburgh, have purchased a large lot in Newcastle, where they propose erecting a foundry, 200 x 100 feet; a finishing shop and warehouse, 175 x 50 feet and four stories in height, besides all the other storehouses, sheds, outbuildings, &c., necessary to a complete establishment of the kind. The buildings are to be of brick and stone, built in the most substantial manner. They will employ probably 150 hands. They find themselves cramped for room in their present location.

PITTSBURGH AND VICINITY.

A. M. Byers & Co. are putting up a new building at their mills on the South Side, which is being built of iron from the Main Centennial Building. This famous building has furnished material for a number of iron works' superstructures in this vicinity.

The Pittsburgh Steel Casting Co.'s new blooming mill is approaching completion. The building is of iron, 102 x 200. The engine is in position, and they are now waiting for the rolls.

OHIO.

The new mill of the Ward Iron Co., at New Philadelphia, will contain 20 single puddling furnaces, one muck and two sheet trains and an 8-inch mill, with the necessary heating furnaces. They hope to start the muck mill by November, and the sheet mills by December at least.

Dispatches from Steubenville, dated September 10, say: Yesterday the new iron company recently organized to erect a rolling mill and nail works at Lagrange, elected the following officers: President, David Spaulding; directors, Thomas B. Taylor and T. J. Holliday, of this city; Theophilus Pugh and Squire Murnos, of Wheeling, W. Va.; S. Clouse, of Bellaire. The officers will meet upon the ground to-morrow morning to make

arrangements for the erection at once of the new rolling mill with 60 nail machines. The capital stock is \$300,000. Charles Spaulding will locate at Lagrange and have charge of the works.

At the Akron Iron Co.'s mill, Akron, what is by all odds the largest stationary engine in Summit County, is in operation. It comes from the Cuyahoga Steam Furnace Co., and is of 550 horse-power. The cylinder is 30 x 54 inches, and the piston has a 54-inch stroke. The fly-wheel is 20 feet in diameter, and weighs 40 tons. The main shaft is 16 inches in diameter. This splendid piece of machinery started off without a jar, and is working to the entire satisfaction of the company.—*Beacon*.

The Ironton Mfg. Co. are crowded to their utmost capacity, and have orders ahead for wheelbarrows for three months.

Etna Charcoal Furnace was blown in the first part of last week. They expect, with the new hearth and other improvements, to increase their daily output to about 12 tons.

Contractor Thompson has begun work on the new addition to be erected at the Malleable Iron Works, Youngstown. The largest addition is to be 230 x 75 feet in dimensions, and is to be used as a foundry. The others are to be 70 x 25 and 40 x 30 feet respectively. The first is to be used in the trimming department, and is to contain six rooms; the second will be used as a shipping department, and will contain two rooms. The new building will be completed inside of 45 days. A portion of the ground on which the additions are being erected, over half an acre in extent, was purchased from the Himrod Furnace Company.

The Barney & Smith Mfg. Co., Dayton, are actively engaged in the construction of passenger and freight cars, from three to four months' orders, from old contracts, having yet to be filled. They have just received a new steam hammer, and are employing 1200 men.

Peter Gerlach & Co., of Cleveland, are making a large machine for sawing sugar hogshead staves for a St. Louis party. The cylinder saw is 36 inches in diameter, and 58 inches long. It is made of steel, and revolves at the rate of 1200 revolutions per minute. The capacity of the machine is from 4000 to 5000 staves per day, and saves 30 per cent. of the timber formerly used, and 25 per cent. of the labor.

The Witman Stove Company, at Ironton, turned out 157 stoves last week. The addition to their foundry is now completed, and they expect to put on four new molders next Monday.

ILLINOIS.

The Lock Stitch Fence Co., of Joliet, have made room for six more machines, by a recent addition to their works.

The Chicago Polished Steel Shafting Company, lately incorporated with a capital of \$50,000, for the manufacture of polished steel shafting, have just purchased five acres of ground in close proximity to the Calumet Iron and Steel Company's plant at Cummings, and are erecting thereon a building 60 x 100 feet. Besides \$20,000 worth of machinery which will be placed in these works, improved machinery of Mr. Wm. H. Whyte's will also be used. The works are expected to start up about October 15. Wm. H. Whyte, Wm. H. Whyte, Jr., and Harry D. Whyte, are the principal members of the company.

The Streator Glass Company, whose works were rebuilt last spring after they were burned down started up work last Saturday with a force of 76 men.

The Aurora Smelting and Refining Co., of Aurora, are placing two 40-horse-power boilers and new machinery in their works.

It is stated on good authority that the Chicago Lock Company will leave their present quarters on Canal street in this city and move their works to Grand Crossing. The company have purchased the old watch factory buildings, and, when in full running order, will employ about 200 men. The company is comparatively a new enterprise. The officers are: H. D. Huff, president; G. G. Calkins, treasurer, and James T. Ganson, secretary.—*Chicago Industrial World*.

The Joliet Wire Company, having recently sold out their business to the Ashley Wire Company, of Joliet. The last-named company are improving the works by the placing in of \$10,000 worth of machinery, including a 300-horse-power engine, as well as a battery of four boilers. They will manufacture all sizes of steel wire, and employ 125 men. The capacity of the works will be three carloads a day and by October 1 the works will be in full running order.

MISSOURI.

We clip the following items, regarding St. Louis industries, from the *Age of Steel*: The Laclede Rolling Mills are working over 600 men and running double turn in every department. The Kingsland & Ferguson Mfg. Co. report an excellent trade in agricultural machinery. The Krein Mfg. Co., after a shut down of a few weeks for repair work, have started up their works. The St. Louis Wire Fence Co. have added considerable new machinery to their works of late and are running to their fullest capacity.

MICHIGAN.

The following table exhibits, in gross tons, the total lake shipments of iron ore from upper peninsula ports the present season, up to and including September 6, together with the amount shipped during a corresponding period last year:

Name of port.	1891.	1892.
Escanaba.....	941,123	1,320,616
Marquette.....	470,000	687,994
L'Anse.....	35,011	44,132
St Ignace.....		34,738
Total.....	1,446,134	2,087,480

Showing an increase of 538,337 tons.—*Marquette Mining Journal*.

KENTUCKY.

The Norton Iron Works are profiting by their enforced idleness, and are making extensive repairs and increasing the capacity and efficiency of their nail factory. They have obtained from the American Nail Machine Co. the right to use Coyne's improved automatic nail selector on their nail machines.

CALIFORNIA.

The foundations for the building of the new Pacific Iron and Nail Co., at Oakland, are

going down rapidly, and the works are expected to be completed and in operation by the 1st of November at least. They will have 70 nail machines.

The Bridge Painters' Strike.—About 100 of the men engaged in painting the floor beams and trusses of the Brooklyn bridge struck last week in consequence of an order issued by the foreman, Mr. Adams, to the effect that each gang of six men on one scaffold must paint three floor beams with the accompanying cords per day. The men considered the order unjust and declined therefore to continue work under it. It is hardly necessary to inquire whether or not such an order is an injustice to the men. The fact is palpable that it is an extremely injudicious move. If there is one part of the work which requires the utmost care, and ought not to be slurred or hurried, it is the painting of the metal in this structure, which is constantly exposed to humid salt air, and, therefore, requires the best possible protection from rust. Considering that it has taken the ring 14 years to get enough of structure to do any painting on at all, it would seem immaterial whether one gang painted two and one-half or three floor beams per day—but it is material that they should be well and carefully painted. The absurdity of this order is only of a piece, however, with the rest of the management of this gigantic job.

The Ironmonger reports that it is now all but finally arranged that the manufacture of steel from Scotch pig iron by the basic process will be established near Glasgow. The works of the company which has been formed have already been described in our columns, and further particulars relating to them are therefore unnecessary in this connection. One or two firms, who have been erecting works for the Bessemer process, have, it is said, been induced to suspend operations until they see the results of the experiments which have been going on for some time.

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THE HINGE CANNOT
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With or without Lathe Attachment.
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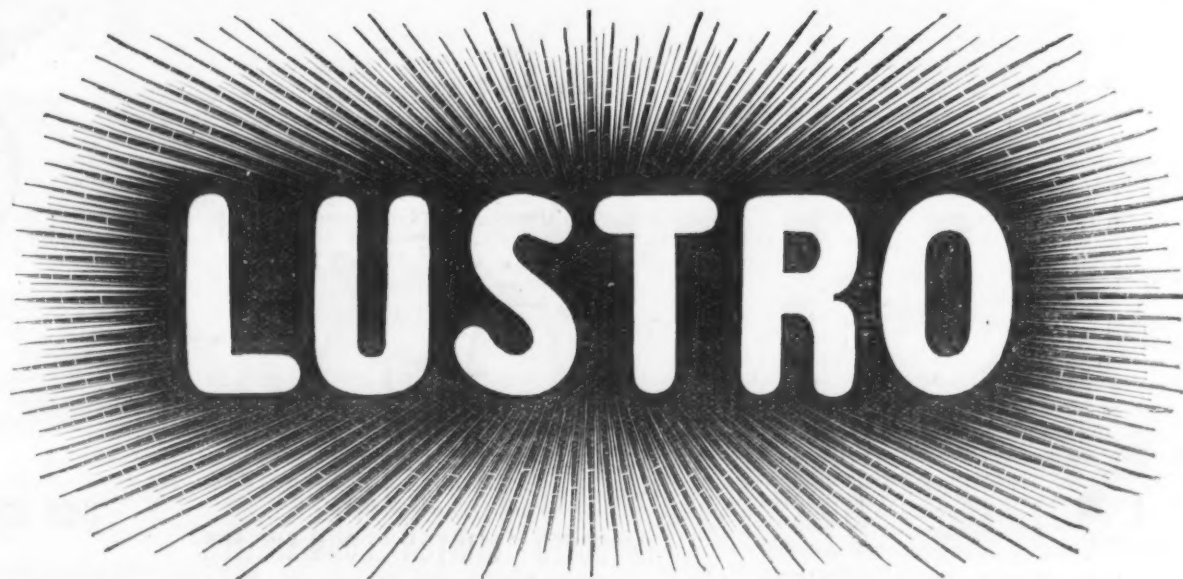
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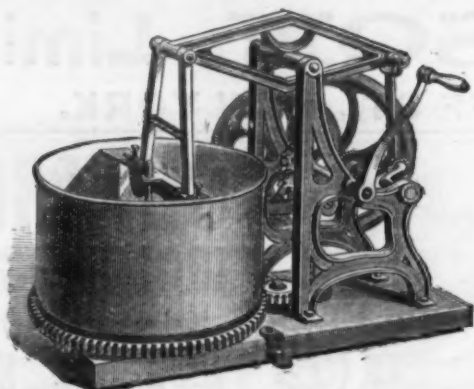
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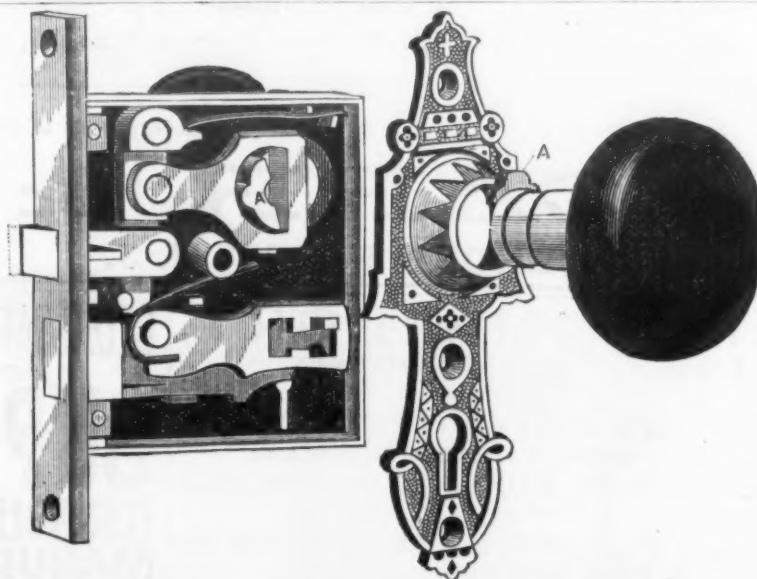
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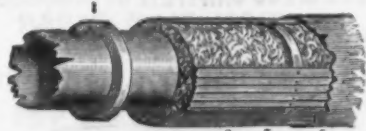
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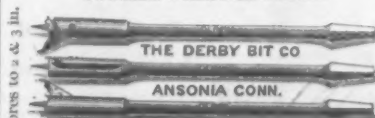
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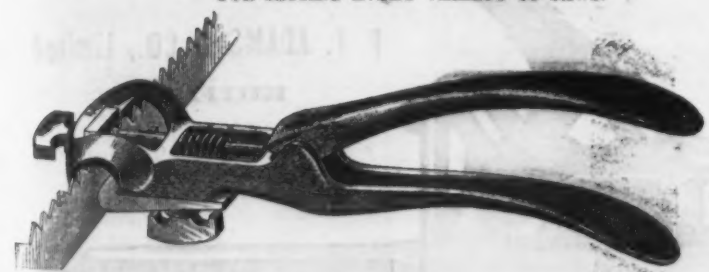
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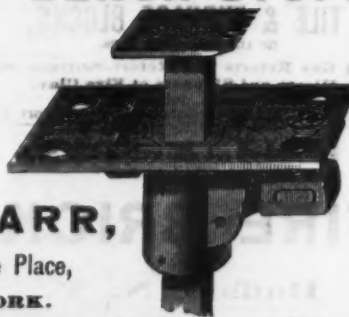
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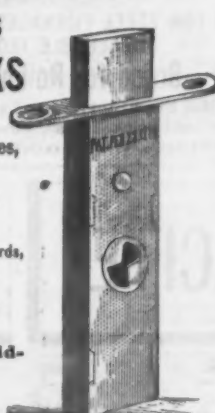
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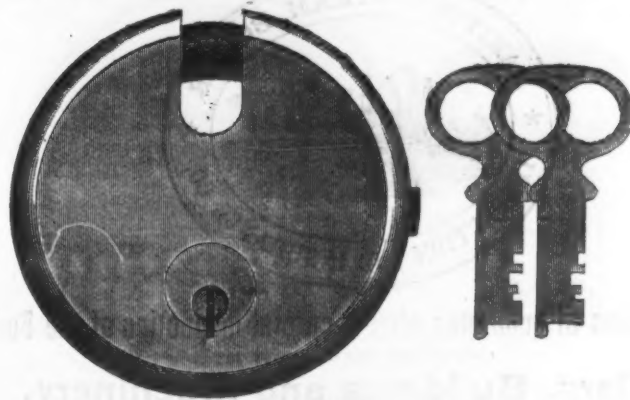
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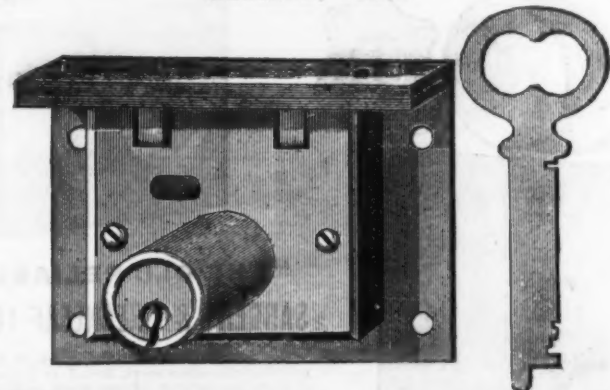
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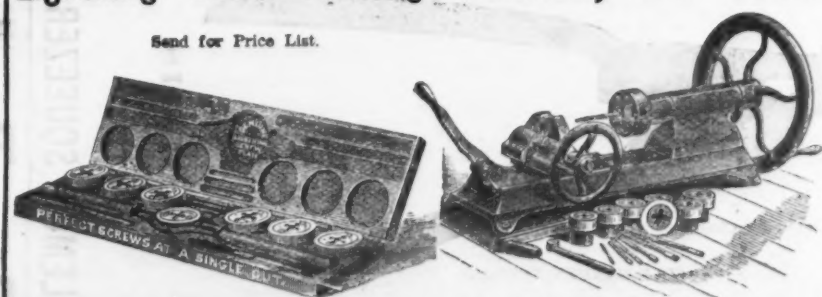
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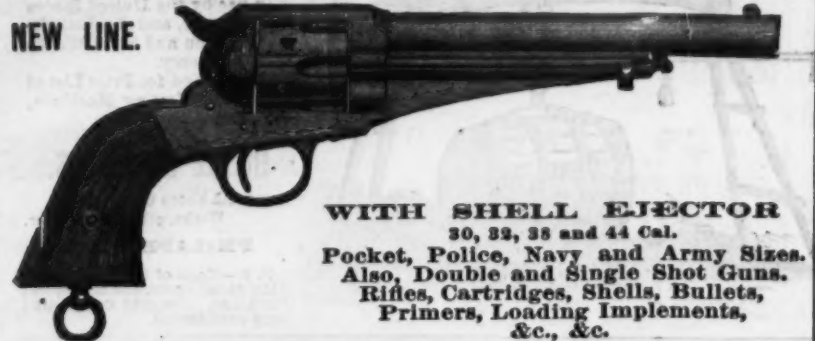
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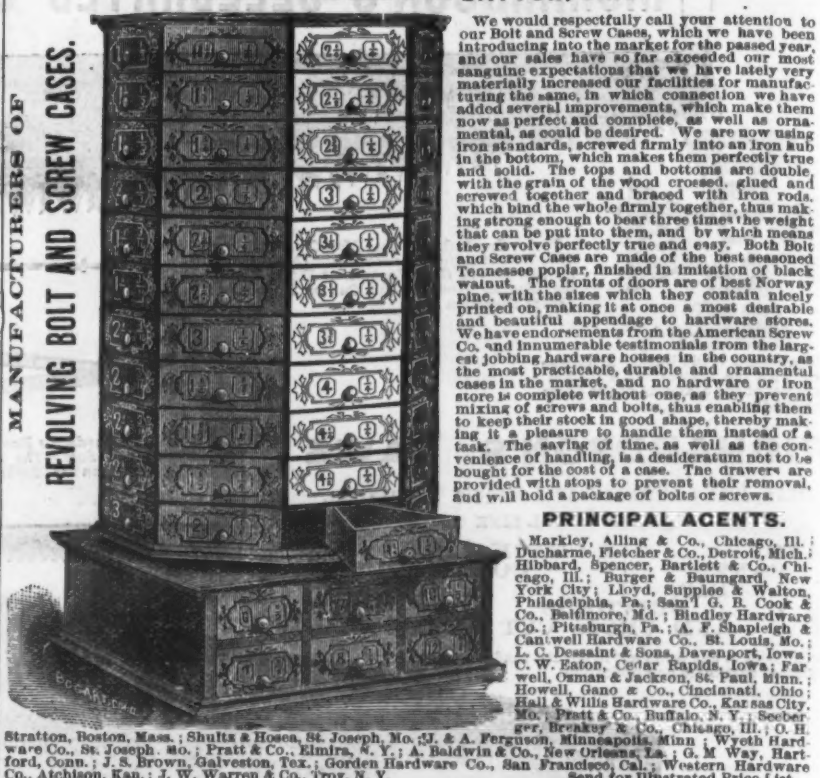
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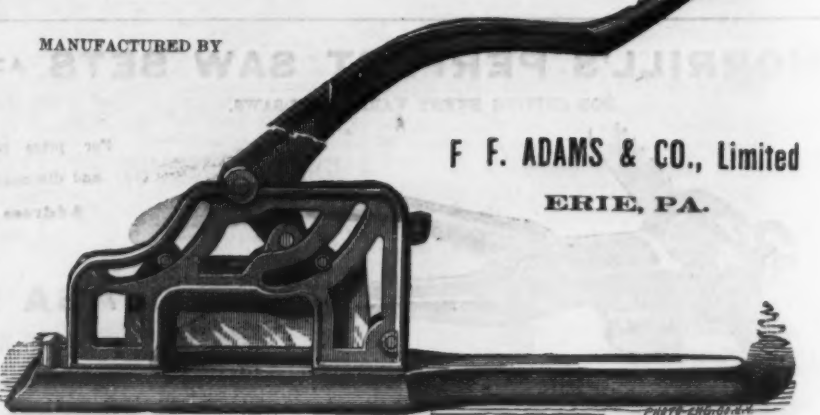


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	Iron Rails.....	100,000 "
	Steel Rails.....	100,000 "
	Total Capacity per year.....	403,000 "

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Of Steel and Iron, up to 30 inches wide, and of any desired thickness and length.

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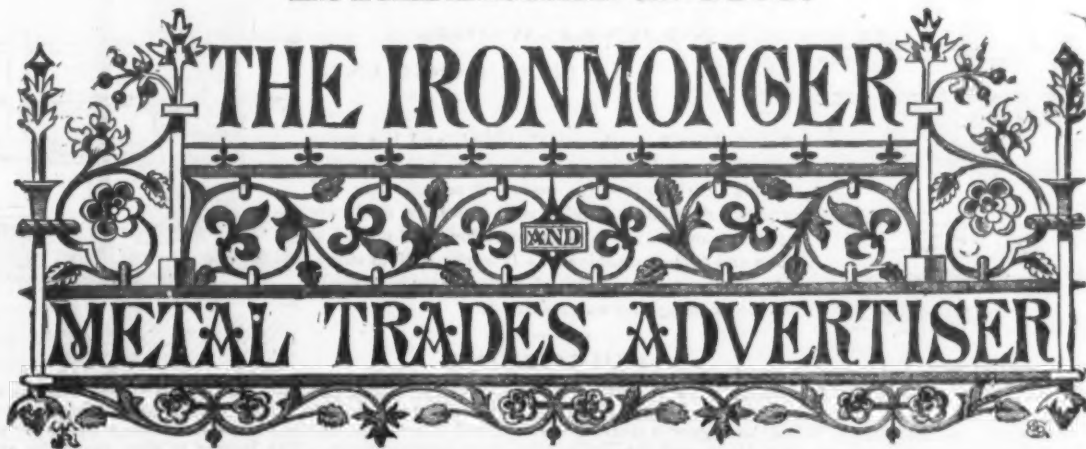
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OFFICE: 44a CANNON STREET, LONDON, E. C.

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Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.

Special Correspondents.—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. The *Week, Legal News, Trade Notes, Bankruptcies, Foreign Notes, Colonial Notes, Merchants' Circulars, &c.*, are each departments of the journal containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French, Belgian and other Special Correspondence.

SUBSCRIPTIONS

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With which is incorporated The Universal Engineer.

is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication for the next twelve months will be as follows:

SEPTEMBER 20, OCTOBER 28, NOVEMBER 25, DECEMBER 23, 1892, JANUARY 20, FEBRUARY 17, MARCH 10, APRIL 7, MAY 5, JUNE 2, and 30, JULY 28, and AUGUST 25, 1893.

This Supplement is published in

FOUR LEADING COMMERCIAL LANGUAGESof the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within each but in the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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No Farmer, Nurseryman, Railroad
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SHOULD BE WITHOUT ONE.

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NO CLOGGING.

This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.



Fig. 2.

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Sargent & Co., New Haven, Ct.
P. & F. Corbin, New Britain, Ct.
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Eaton, Cole & Burnham Co., Bridgeport, Ct.
Norwalk Lock Co., Norwalk, Ct.
Bradley & Hubbard Mfg. Co., Meriden, Ct.
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Washburn & Moen Mfg. Co., Worcester, Mass.
Trenton Lock and Hardware Co., Trenton, N. J.
Peck, Stow & Wilcox Co., Southington, Ct., and Cleveland, Ohio.
Shurmer & Massey Mfg. Co., Cleveland, Ohio.

Elbell, Gilliam & Co., Canton, Ohio.
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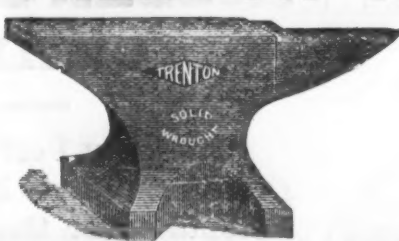
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THE TRENTON ANVIL.



SOLID WROUGHT IRON, STEEL FACE
(P. W. Pattern), WARRANTED.

Particular attention is given to the manufacture of all kinds of Anvils when drawings are furnished.

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MORE RAIN---MORE ROOT.

It has been too wet to call and see you, but we remind you that the continued "spell of weather" has increased the sale of Hill's Triangular Hog Rings over 27 per cent.



DAMP.

DRY.

Dec. 1881.....	418,650	Dec. 1880.....	149,050
Jan. 1882.....	2,244,375	Jan. 1881.....	1,575,700
Feb. ".....	1,843,450	Feb. ".....	1,353,000
Mar. ".....	3,215,100	Mar. ".....	1,319,700
April ".....	1,491,100	April ".....	1,051,700
May ".....	1,405,400	May ".....	1,376,100
TOTAL.....	10,606,475	TOTAL.....	8,321,900

GAIN, 2,279,185 RINGS

Fennor prophesies a "soft" summer, enabling Hogs to Root unless prevented by the use of Hill's Triangular Hog Rings. All orders promptly filled on day of receipt at our GUARANTEED prices.

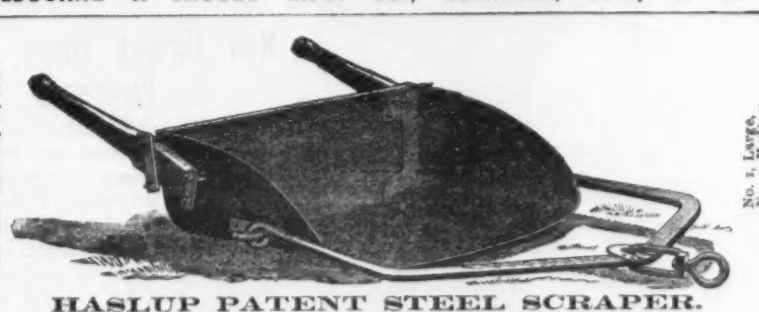
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Made from one sheet of Steel, 3-16 of an inch thick, PRESSED into shape. It is without Seam, Joint or Rivet, and is the Lightest, Strongest and most Durable Scraper made. Fills easier and cleans better than any other, and there is nothing about it to get out of repair. We also manufacture the well-known

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And a full line of
WHEELBARROWS, ROAD PLOWS, &c.
For Prices, Terms &c. address
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HASLUP PATENT STEEL SCRAPER.
The most practical, best working and strongest ever made. Especially adapted for Contractors. Beats all others. Manufactured only by
SIDNEY STEEL SCRAPER CO., Sidney, Ohio, U. S. A.
Send for Circulars.

Patent Hand Iron Cutter, with and without Punch Attachment, for Iron & Steel.

Our No. 10 Machine will cut 4 x 8, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 12 Machine will cut 4 x 10, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 14 Machine will cut 4 x 12, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 16 Machine will cut 4 x 14, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 18 Machine will cut 4 x 16, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 20 Machine will cut 4 x 18, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 22 Machine will cut 4 x 20, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 24 Machine will cut 4 x 22, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 26 Machine will cut 4 x 24, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 28 Machine will cut 4 x 26, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 30 Machine will cut 4 x 28, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 32 Machine will cut 4 x 30, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No. 34 Machine will cut 4 x 32, 1 1/2 inch round or square, and punch 1/2 in. hole through 1/2 in. iron. Our No

PATENT RUBBER BUCKETS AND CHAIN FOR CHAIN PUMPS.



The only Perfect Expanding, Self-Draining Valve Bucket made. Our Patents cover the use of the Rubber, Nut and Bolt for Expanding, Tube and Valve for Draining. Order only the Rumsey Bucket, and avoid infringing.

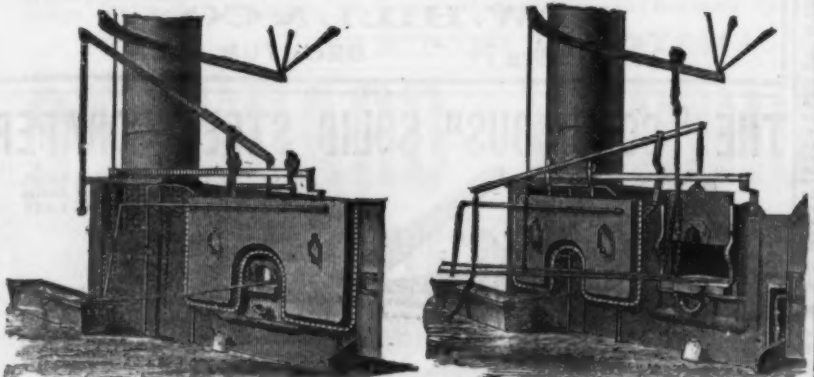
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AMERICAN BOLT CO., Lowell, Mass.,
MANUFACTURERS OF

Bolts, Nuts, Washers, Chain Links, Car Bolts, Bridge Bolts, Lag Screws, &c.

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For Protecting the Men from Heat when Working in Front of Puddling, Heating and other Furnaces.

H. McDONALD, Patentee,

MANAGER SLIGO ROLLING MILLS,

PITTSBURGH, PA.



DRILL PRESSES.

New Upright Power Drill Presses.

No. 3, swings 21 in., back geared, quick return motion; large steel spindle, balanced in column; revolving Arm and Table; cut Gears; Pulleys, 10 x 2 1/2; a strong brace extends from base to column, stiffening it at point of greatest strain—a new feature. Weight, 1100 lbs.; height, 6 feet. Price, \$210. **Smaller Size**, No. 1 1/2 (not back geared), on legs, swing 15 1/2 inches; 4 speeds; tight feed, cut bevel gears, 12 inch iron table, can be raised and lowered; spindle 26 inches long, balanced by weight in column, with Morse taper hole; steel rack; weight, 225 lbs.; height, 5 feet. Net, \$85. **Smallest Size**, No. 1, swing 13 in., lever feed, 3 speeds; tight and loose pulleys, to set on bench; weight, 45 lbs. Net, \$35.

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38 W. Dey Street, New York.

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Manufacturers of

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THE DETROIT LUBRICATOR MFG. CO.'S CONTINUOUS FEED Lubricator Cups

For oiling valves and cylinders of steam engines by the only perfect method. The oil passes to sight, drop by drop, into the column of steam where it vaporizes, thus becoming a steam lubricant, oiling perfectly every part reached by the steam. Any clean oil, black or white, light or heavy, may be used. Saves from 50 to 75 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to responsible parties on twenty days' trial, if desired. In ordering state diameter of cylinder.

NOTICE.—The first Lubricators ever made, showing the oil passing drop by drop through a transparent water chamber, were devised by us, and the same are fully embraced by many Letters Patent owned and controlled by us. Lubricators of every nature embodying the above feature, made by other parties, are encroachments upon our rights, and we will hold purchasers and users, as well as manufacturers, responsible in damages for such violations.

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Office, 98 Griswold St., Detroit, Mich.
First Prizes at Fair American Institute and Millers' International Exposition, Cincinnati, 1886.
Note.—In our recent suit against the American Lubricator Co., of Detroit, before Justice Stanley Matthews, of the U. S. Supreme Court, involving their sight-feed feature, a decree was rendered in our favor August 20, 1893.

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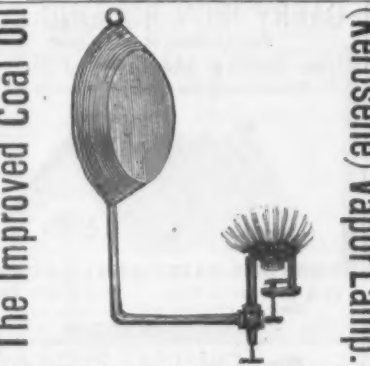
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The Best Boiler Feeder Known. Unequalled for simplicity and always reliable. Does not require adjustment for varying pressures of steam. Will start when the injector is hot. Less liable to get out of order than a pump. Always delivers water hot to the boiler.

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The Improved Coal Oil (Kerosene) Vapor Lamp.

The best light for Rolling Mills, Foundries, Shops, &c. Used by all the largest manufacturers in the country. Gives perfect satisfaction. The new improvements make it the most Durable and Cheapest lamp in the market. For further information, address: **T. R. LOOMIS, Cazenovia, N. Y.**

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J. F. WOLLENSAK, Patentee and Sole Manufacturer, CHICAGO, ILL.

T. NEW'S PREPARED ROOFING

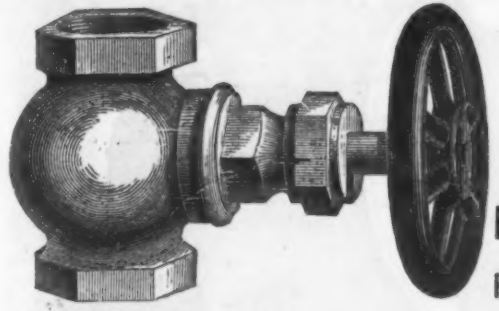
For steep or flat roofs. Applied by ordinary workmen at one-third the cost of tin. Circulars and samples free. **T. NEW, 39 John St., New York.** BARRETT, ARNOLD & KIMBALL, Western Agents, Chicago, Ill.



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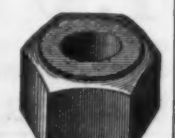
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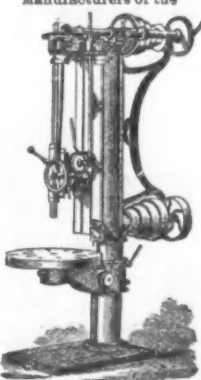


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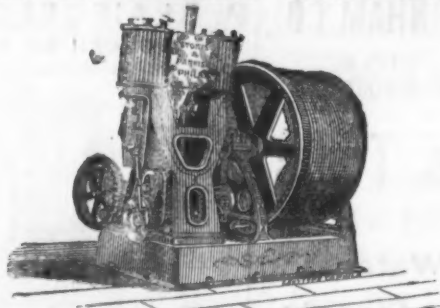
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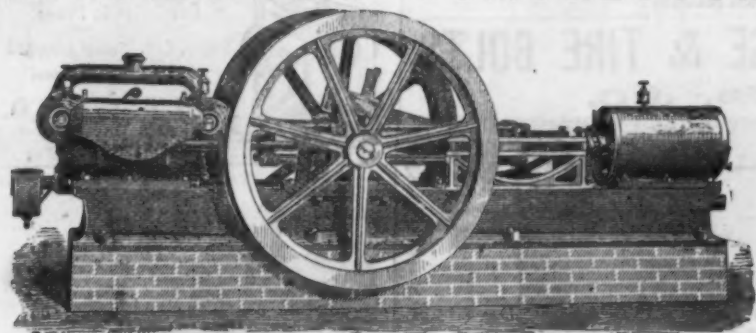
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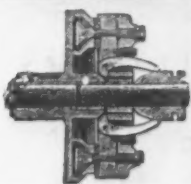
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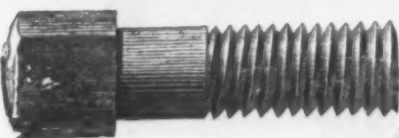
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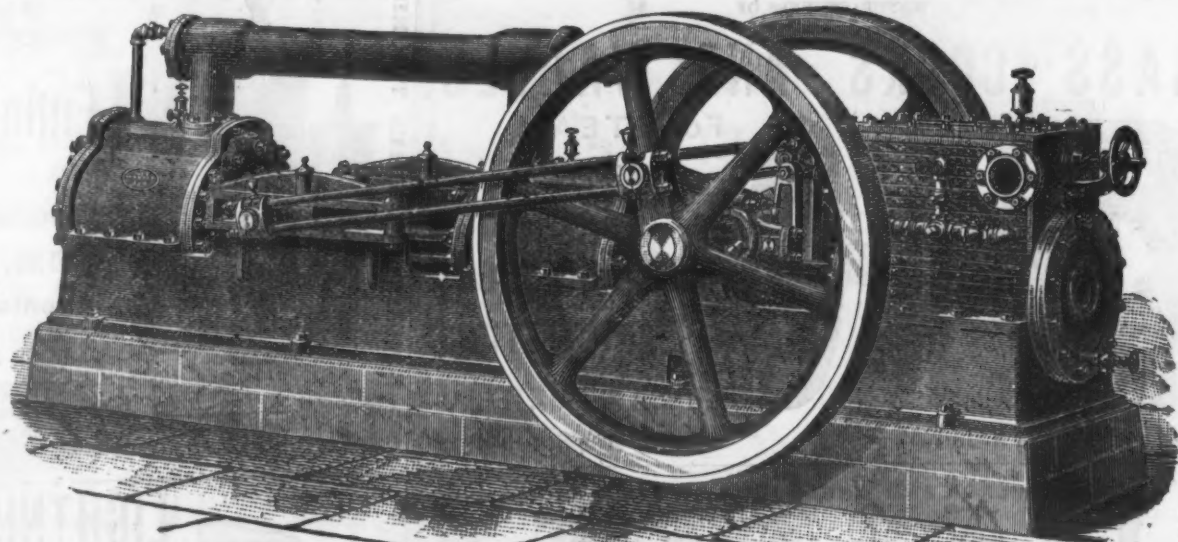
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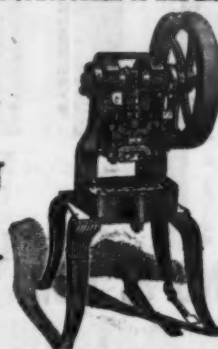
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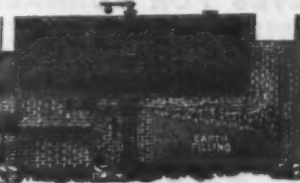
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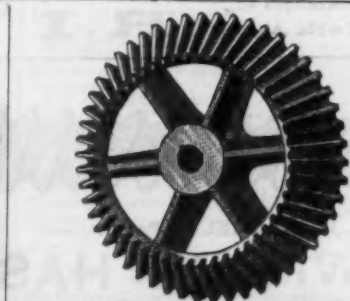
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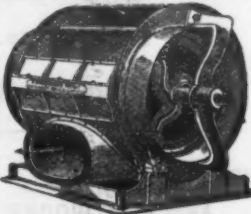


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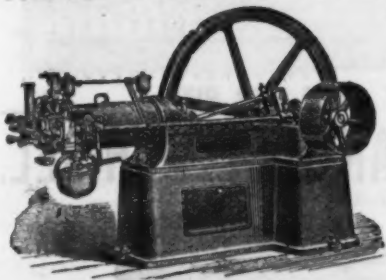


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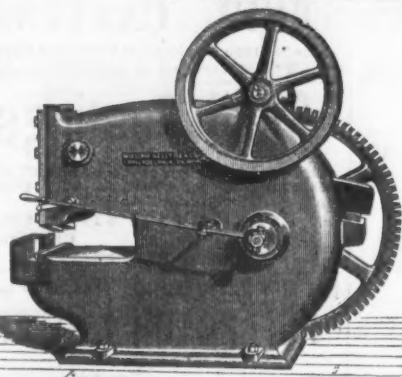
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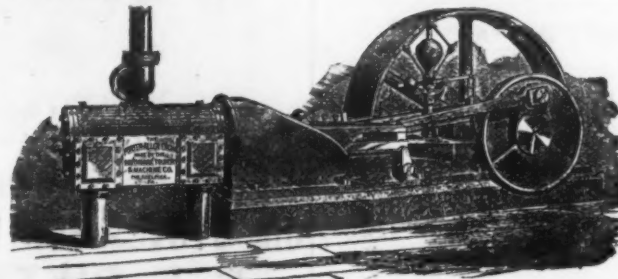
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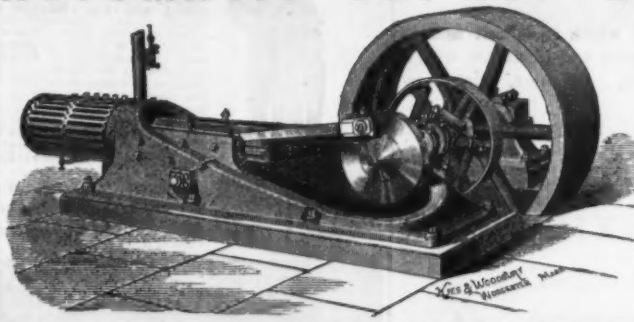
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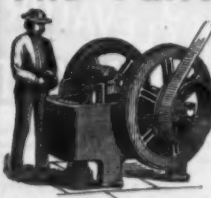


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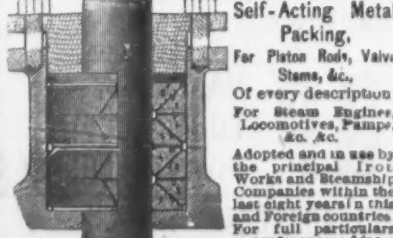
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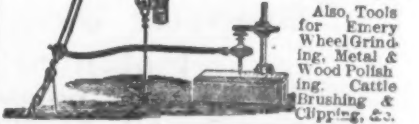
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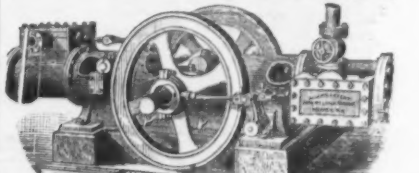
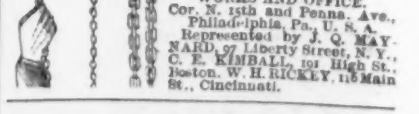
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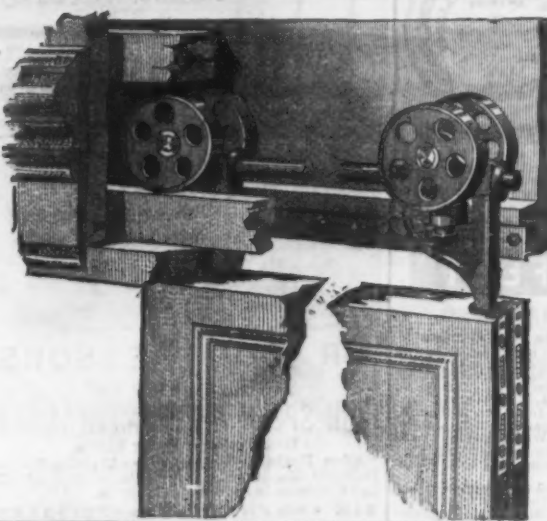
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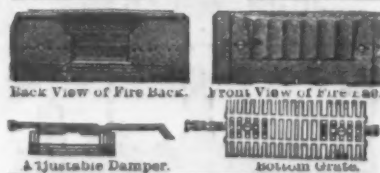
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